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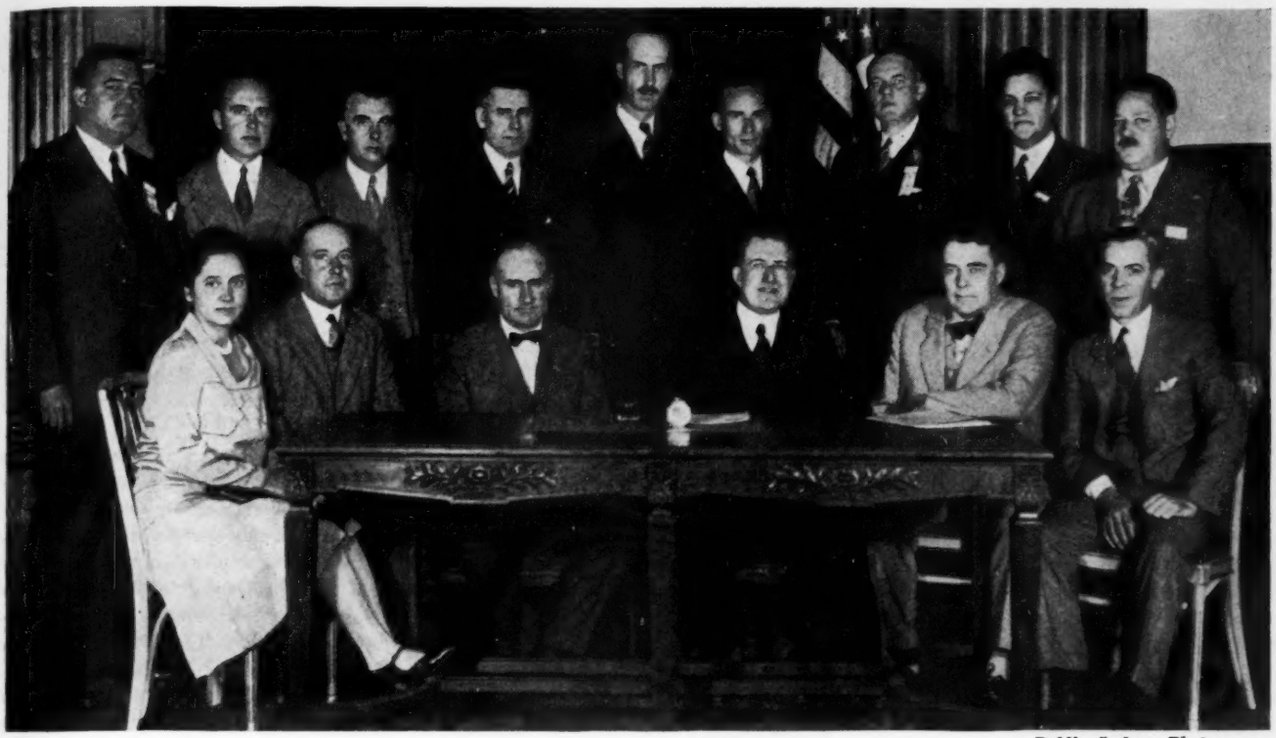

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GROUP OF OFFICIALS AND COMMITTEE CHIEFS ON HAND FOR OPENING SESSION

Seated, Left to right—Dr. Frances H. Clark, vice chairman Thursday afternoon technical session; J. M. Watson, treasurer A. S. S. T.; Dr. Zay Jeffries, nominated for president A. S. S. T.; Frederick G. Hughes, president, A. S. S. T.; Fred T. Llewellyn, president, American Welding society; C. A. McCune, treasurer American Welding society

Standing, Left to right—W. B. Coleman, chairman meetings and papers committee and committee on arrangements, A. S. S. T.; Ray T. Bayless, editor, *Transactions*, A. S. S. T.; W. H. Phillips, J. H. Nead, J. Fletcher Harper and L. D. Hawkridge, directors, A. S. S. T.; R. M. Bird, chairman opening session of convention; A. W. F. Green, secretary-treasurer, Philadelphia chapter, A. S. S. T.; and W. H. Eisenman, secretary A. S. S. T.

Tenth Steel Treaters Convention Sets New Standards

MARKED by a technical program of unusually high merit and an exposition by pleasing diversity in the products, equipment and materials displayed, the Tenth Annual convention and show of the American Society for Steel Treating, which was held last week in Philadelphia, more than realized the hopes of its most ardent sponsors. Joining forces with the American Welding society and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, the steel treaters conducted their activities under the name of "National Metal Week," descriptive and appropriate in every sense. All records for attendance at a technical session were broken when about 600 crowded their way into the ballroom of the Benjamin Franklin hotel Wednesday to hear Dr. W. H. Hatfield deliver the annual Campbell Memorial lecture. Interest in the technical sessions continued unabated throughout the week, due perhaps to the fact that never before have so many papers of such timely value been gathered together for presentation at an annual meeting of the society. The paper announcing the development of a new tungsten carbide tool material which promises to have a direct influence on the practice of machin-

ing hard steels and nonmetallic materials, which was delivered at the Thursday morning session, is fairly typical of the important character of the data contained in many of the papers.

The Tenth Annual National Metal exposition held in the Philadelphia Commercial museum, a complete description of which appeared in last week's issue of IRON TRADE REVIEW, constituted a realistic panorama of the latest developments in equipment, materials, processes and supplies required for the making, treating, fabricating, and assembly of metal products for industry. That the exhibits attracted more than casual attention from the thousands who thronged the exposition hall was evidenced by the fact that before the show was half over, many of the articles exhibited were placarded with "Sold" signs.

The serious side of the convention was balanced by a well rounded program of entertainment which included a grand ball on Tuesday evening, an annual banquet on Thursday evening, numerous inspection trips to industrial plants in and around Philadelphia, and a varied program for the ladies.

Complete reports of the various activities of the American Welding society and the Institute of Metals are presented elsewhere in this issue.

Discuss Stainless Steels and Carburizing

MEMBERS of the American Society for Steel Treating attending the opening session Monday morning were welcomed to Philadelphia by R. H. Patch, vice chairman of the technical session and president of the Philadelphia chapter. R. M. Bird occupied the chair.

Alloy steels containing from 2 to 6 per cent aluminum, 7 to 13 per cent chromium and 1 per cent maximum silicon and carbon possess high critical ranges. This was the purport of a paper entitled "An Investigation of the Physical Properties of Certain Chromium-Aluminum Steels," prepared jointly by F. B. Lounsberry and W. R. Breeler, vice president and research metallurgist, respectively, Atlas Steel Corp., Dunkirk, N. Y. The latter emphasized the fact that the addition of nickel produced an unusual low temperature phenomenon and its effect on hardness, microstructure and resistance to oxidation at elevated temperature suggested a certain dependence on the value of the ratio of nickel to total chromium plus aluminum plus silicon.

"Chromium-Copper Steels as Possible Corrosion Resisting Ferrous Alloys" was the title of a paper by B. D. Saklatwalla, vice president, and A. W. Demmler, metallurgist, Vanadium Corp. of America, Bridgeville, Pa. Considerable data was presented by Mr. Demmler verbally and by lantern slides representative of experimental laboratory work executed in studying the merits of chromium-copper combinations in steel. The main purpose of the study, Mr. Demmler pointed out, was the development of commercial steels of high physical properties combined with fair corrosion resistance and producible at a commercially reasonable cost.

In speaking on the machining of high-chromium steels, particularly those to which zirconium sulphide has been added, F. R. Palmer, Carpenter Steel Co., Reading, Pa., pointed out that in machining ordinary stainless steels the tendency of the steel is to adhere to the tool under heavy pressure while in grinding the chips from the steel tend to load up the wheel. With the new type stainless steels containing up to 0.40 per cent zirconium sulphide, he stated the machining qualifications are satisfactory. From the standpoint of hot working the new steel can be forged and rolled under 2100 degrees Fahr. with no difficulty. He declared that no objectionable brittleness is encountered in the steel and that the zirconium sulphide does not affect the grain growth.

A paper, "Stainless Iron and Its Application to the Manufacture and Transportation of Nitric Acid," by W. M. Mitchell, Central Alloy Steel Corp., Massillon, O., brought the morning session to a close. After mentioning the position of the chemical industry and presenting some of the causes which have made the development of stainless alloys necessary the author took up the metallurgical phase of the subject.

A. E. White was chairman and V. C. Homerberg, vice chairman of the afternoon session which was held in the assembly room at Commercial Museum. The first paper at this session was presented by R. H. Hobrock, engineering experiment station, Purdue university, Lafayette, Ind., was entitled "Surface Hardening of Special Steels with Ammonia Gas Under Pressure." The author showed slides of various curves depicting the depth of hardness for nitrided specimens and explained each in considerable detail. He pointed out that an alloy intended for the establishment of a hard surface of no large depth might contain much more aluminum than an alloy intended for use where a deep case is required. Where high surface hardness and deep penetration are to be obtained by nitration under pressure, he explained, the amount of aluminum in solid solution in the alloy must be controlled accurately.

The need for inspection testing of nitrided products was emphasized by G. M. Eaton, Molybdenum Corp. of America, Pittsburgh, who spoke on "Methods of Approximating Certain Physical Characteristics of Nitrided Steel Cases." The author presented slides of photomicrographs showing the impressions produced on the nitrided case by practically all recognized hardness testing machines. After describing the Vickers-type diamond indentor hardness tester at length, Mr. Eaton warned of the danger of failure which will tend to discredit nitrided products if large quantities are made without adequate inspection testing.

If silicon absorption is confined to surface layers of iron or steel, carbon

Plan Western Metal Congress

THE AMERICAN SOCIETY FOR STEEL TREATING is announcing the Western Metal Congress and in connection with it there has been arranged a Western States Metal and Machinery exposition. The following western sections of societies and associations will participate in the presentation of papers before the Western Metal Congress: American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, American Petroleum institute, California division of development and production, American Welding society, Society of Automotive Engineers, Pacific Coast Electrical association, Pacific Coast Gas association, Institute of Marine Engineers, Metal Trades and Manufacturers association, Chamber of Mines and Oils, National Purchasing Agents association, American Society for Steel Treating.

LOS ANGELES—WHERE WESTERN METAL CONGRESS AND MACHINERY EXPOSITION WILL BE HELD

absorption during case carburization may be retarded without materially affecting the rate of inward migration of the carbon after it has been absorbed, according to E. G. Mahin, professor of metallurgy, Notre Dame university, Notre Dame, Ind. Mr. Mahin was co-author with R. C. Spencer, metallurgist, Caterpillar Tractor Co., Peoria, Ill., of a paper entitled "Depth and Character of Case Induced by Mixtures of Ferroalloys with Carburizing Compounds." The speaker described how it is possible to shorten the time required for completing case carburization by using an ordinary carburizer with ferrosilicon and by introducing higher carburizing temperatures.

Discuss Carbon Solubility

Unsatisfactory results obtained in commercial carburizing of abnormal steels when low temperatures are employed are traceable to the low carbon content of these steels at low temperatures, according to O. E. Harder, professor of metallography, University of Minnesota, Minneapolis, who as joint author with W. S. Johnson, American Rolling Mill Co., Middletown, O., presented a paper entitled "Solubility of Carbon in Normal and Abnormal Steels." At a temperature of 1525 degrees Fahr. the carbon content of the case of an abnormal steel is much less than that of a normal steel at the same temperature, he stated, and as the carburizing temperature increases, the carbon content of an abnormal steel approaches that of the normal steel.

Consider Latest Problems of Metallurgy

PROBLEMS in the production of open-hearth steel were discussed at the Tuesday morning technical session in the ballroom of the Benjamin Franklin hotel. Dr. John A. Mathews, president, Crucible Steel Co. of America, New York, presided as chairman. The papers ranged from reports on investigations on the fundamental principles of steelworks metallurgy to discussion of phases of works operation.

In the first paper prepared by W. E. Griffiths, research metallurgist, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., and C. E. Meissner, development engineer, Chrome Steel Works, Carteret, N. J., complete logs of three open-hearth heats in a 25-ton furnace were presented. Experiments were carried out in the plant of the Chrome Steel Works. Notes on the effect of ferrous alloy additions on slag composition and metal bath analysis were carefully recorded and shown graphically. The record is considered a useful contribution to the literature on acid open-hearth steel melting practice.

A general survey of the physicochemical relations which obtain during the process of refining of steel in a basic open-hearth furnace was outlined in the second paper read by Alexander L. Feild, metallurgist, Union Carbide & Carbon Corp., New York. The material contained in this paper centered about the significance of differential equations of carbon removal, the subject being dealt with in a deeply technical fashion.

H. P. Rassbach, Midvale Co., Philadelphia, author of a paper entitled, "Manufacture of Acid Open-Hearth Steel for Forging Ingots," outlined various problems in connection with steelmaking for the unusual type of heavy-duty forgings produced at Nicetown.

In the final paper at this session, Dr. C. H. Herty Jr., physical chemist, Pittsburgh Experiment Station, bureau of mines, Pittsburgh, reported on a research conducted by himself and G. F. Fitterer, junior metallurgist at the station, dealing with the function of silicon in the basic open-hearth process. He presented their results on the mechanism of deoxidation of steel with silicon. Among the conclusions were the following:

1. That the mechanism of deoxidation with silica is, first, the formation of silica by the reaction

$$Si + 2FeO = SiO_2 + 2\ Fe$$

2. A fluxing of more FeO by the silica, forming a ferrous silicate inclusion.

Complete deoxidation of steel is impossible unless the oxide formed is absolutely infusible and insoluable at

steelmaking temperatures. It may also be concluded that silicates high in iron or manganese will be more readily eliminated from the bath than high silica particles, due to their lower melting point, with consequent increased rate of coalescence.

In discussing this paper briefly, Dr. W. H. Hatfield said that if oxygen is reduced to a minimum under best conditions, inclusions in the steel will be a minimum.

Grain Structure Considered

Four papers dealing with different phases of grain structure of iron and steel were presented at the Tuesday afternoon session of the American Society for Steel Treating. The meeting, held at the Commercial Museum was well attended and discussion was lively. The presence of nickel in steel alloys tends to increase the rate of graphitization according to a paper by H. A. Schwartz, manager of research, National Malleable and Steel Castings Co., Cleveland. This paper was read in Mr. Schwartz's absence by Paul D. Merica, assistant manager, development and research department, International Nickel Co., New York. It is a technical study accompanied by diagrams and photomicrographs and it concludes that in the presence of even rather low nickel concentrations, silicon becomes inactive as an accelerator of graphitizations. W. A. Graham, Ohio Brass Co., Mansfield, O., said that beside the effects of nickel noted in the paper his company had found that smoother finish could be secured on malleable castings with certain percentages of nickel. He felt that the work being investigated by Mr. Schwartz was of far reaching importance to malleable foundries.

DR. W. H. HATFIED
Who delivered the Edward De Mille Campbell Memorial lecture on Thursday

Nickel in gray iron is generally understood to be a pearlite builder according to a paper read by J. R. Houston, chief metallurgist, Harnischfeger Corp., Milwaukee. This is fine, if true, but it is a difficult thing to demonstrate because unavoidable variations in fluidity and rate of cooling cause variations in combined carbon. E. L. Roberts discussing this point said that his experience had been that difficulty with cracks at the junction of light and heavy sections of castings could be overcome by the addition of small amounts of nickel, usually about 0.75 per cent.

Microstructure of Steel Rails

O. V. Greene, metallurgist, Reading Co., Reading, Pa., presented a paper describing tests of steel rails with reference to their microstructure. He found that pearlite may be fine or course independent of carbon content. Robert Job, Montreal, Que., asked if the author had found any connection between the structure of steel and the durability of the rails and Mr. Greene said he was sorry but he would have to reply that he hadn't but hoped to do so before long.

Much discussion followed the paper on cutting qualities of alloy steel presented by O. W. Boston and M. N. Landis and read by Professor Boston who heads the shop practice division at the University of Michigan, Ann Arbor, Mich. Mr. Landis is metallurgist with the firm Landis & Landis, Chicago. Machinability is a most important but somewhat elusive property, according to most speakers. Mr. Fishback, Pratt & Whitney Co., Hartford, Conn., and Mr. d'Archambal of the same company discussed tool life in its relation to machinability.

Describes Tungsten-Carbide Tool Material

AN ANNOUNCEMENT which aroused great interest at the Thursday morning session was made in a paper by Samuel L. Hoyt, of the research laboratories of the General Electric Co., describing the use of tungsten carbide as a tool material. By adding pure cobalt, it has been possible to eliminate the weakness and porosity which previously characterized tungsten carbide as a metal. The result is an alloy which is about half as strong as high speed steel but which is sufficiently hard to scratch sapphire. Tungsten carbide tools have been tried out thoroughly in the shops of the General Electric Co., the author of this paper said, and had been found to have remarkable usefulness in machining materials which previously had given much difficulty. For instance, hard rubber and bakelite are strongly abrasive, so that with carbon tool steel, the tool is worn away so rapidly that the cut is on a taper. Tungsten carbide tools resist the abrasion of these materials to such an extent that it cuts them with entire accuracy. Glass, porcelain, Hadfield's manganese steel, hard carbon, mica, bakelite, micalex, genelite and other hard or abrasive materials have been machined satisfactorily with tungsten carbide tools.

Much Interest Manifested

The interest in this paper took the form of many questions, as to the method of manufacturing tungsten carbide, the percentage of cobalt contained, the method of regrinding the tools after they had become worn in service. Mr. Hoyt said that the cobalt content goes up as high as 20 per cent, varying according to the physical characteristics desired; as the cobalt content increases, he said, the hardness increases and the strength decreases. For dies for drawing wire, in which toughness is needed, the cobalt content of tungsten carbide is 8 per cent. The grinding of tungsten carbide tools is done dry, said Mr. Hoyt. In general, however, he refrained from giving specific information about the practical details in connection with the manufacture, analysis and preparation of tungsten carbide tools, referring those interested to the Carboloy Co., which now is marketing this material.

In the discussion of Mr. Hoyt's paper an interesting suggestion was made by H. J. French, Bureau of standards, Washington. He has in mind the replacement of grinding by cutting tools, the cutting to be done at high speed and, possibly aided by the use of cutting compounds, but he did not give any details as to his work along this line.

Mr. French presented a paper entitled "Surface Cooling of Steels in Quenching", which was the longest paper ever presented before the society, and which was highly recommended by several speakers for the

thoroughness with which it covered the various phenomena in surface cooling.

Edgar C. Bain, research bureau of the United States Steel Corp., presented a paper which had been prepared jointly by him and Willis S. N. Waring, Union Carbide & Carbon Research Laboratories. This was entitled "Austenite Decomposition and Length Changes in Steel." An important paper also was presented by Marcus A. Grossman, Central Alloy Steel Corp., Canton, O. This discussed at length the diffusion of oxygen in steel and its influence on the structures of steels of various analyses.

An interesting paper written by Dr. Kotaro Honda, Tohoku Imperial university, Japan, on the nature of martensite crystals, was represented by title. These papers were discussed at length by some 12 to 15 of the country's leading metallurgists.

Metallography Is Topic at Joint Session

NITRIC acid and other common etching agents for copper-nickel alloys have many disadvantages which are largely overcome by the addition of chromic acid, according to H. B. Pulsifer, metallurgist, Ferry Cap & Screw Co., Cleveland, who presented a paper on smoothing and etching at the Wednesday afternoon joint session of the Institute of Metals and the American Society for Steel Treating. Mr. Pulsifer described methods of satisfactory deep etching and mechanical smoothing of the medium hard alloys.

Jeffries Presides at Session

Zay Jeffries, consulting metallurgist, Cleveland, presided at the joint session and five interesting papers on structure of steels and alloys were read and discussed. Of particular interest was the discussion presented by Dr. Albert Sauveur, Harvard university, Cambridge, Mass., in answer to the paper on the microstructure of martensite by Francis F. Lucas, Bell Telephone Laboratories, New York. Dr. Sauveur's position in the metallurgical field was attested by the hearty applause which greeted him before he had a chance to speak. Mr. Lucas' paper was illustrated with slides showing magnifications of 3500 diameters. It presented the further study of martensite by the author following his paper on the same subject presented at the Boston convention in 1924.

The microstructural effect of cold working of high manganese steels was described in a profusely illustrated paper by V. N. Krivobok, associate professor of metallurgy, Carnegie Institute of Technology, Pittsburgh. Another well illustrated paper was that of John A. Gann, metallurgist, Dow Chemical Co., Midland, Mich., entitled "Treatment and Structure of Magnesium Alloys."

A highly technical paper on Neumann bands in ferrite was prepared by C. H. Mathewson and G. H. Edmunds and read by the former, who is professor of metallurgy, Yale University, New Haven, Conn. The paper demonstrates a proof that Neumann bands are twins—the study having been made with the assistance of X-ray reflections from crystal surfaces.

A description of the so-called cloudburst method of hardening and testing for hardness attracted a great deal of attention at the Thursday afternoon session. This description was set fourth in a paper by Edward G. Herbert, Edward G. Herbert, Ltd., Manchester, England, which was read by R. B. Lewis, Tinius Oslen Testing Machine Co., Philadelphia. The cloudburst process, in brief, consists of bombarding the object, to be tested or hardened, with a steady stream of steel balls. These balls, to the number of about 20,000, are placed in machines which drop them by gravity, and the whole 20,000 may be dropped in 10 seconds. The balls may be dropped on a small portion of a surface or may be rained uniformly over the entire surface. The height of the drop determines the force which they exert. The bombardment of the balls quickly locates soft spots in any surface. Furthermore, it has the effect of hardening the surface. By repeated bombardments, a hardened surface which has been hardened by heat treatment may be further hardened, a step which Mr. Herbert alluded to in his paper as "super-hardening."

Alloy Steels Recommended

A. B. Kinzel, Union Carbide & Carbon Research Laboratories, Long Island City, delivered a paper on "Silicon Manganese Steels With Chromium Additions for Engineering Application." He recommended such steels for use by the automotive industry and other users of alloy steels.

An interesting paper was submitted

A general view from the entrance to Philadelphia Commercial Museum, showing some of the steel exhibits at the National Metal Exposition

by Albert E. White and Claude L. Clark, University of Michigan. It was entitled "Evaluation of Stability of Metals at Elevated Temperatures." This paper was discussed by a number of important metallurgists.

W. P. Wood, University of Michigan, and consulting metallurgist with the Cook Spring Co., Ann Arbor, Mich., submitted a paper entitled "Torsional Modulus of Carbon Steel, Phosphor Bronze, Brass and Monel Metal." This paper contained the average results of large numbers or recently completed tests made by the author.

Crane Chains Given Low-Temperature Anneal

SIX papers on miscellaneous subjects constituted the technical session on Friday morning with Dr. Bradley Stoughton, Lehigh university, Bethlehem, Pa., serving as presiding officer. The inconsistent results in ductility and strength that ordinarily are obtained when sling and crane chains are annealed at temperatures unsuited for links that have been severely deformed and cold-worked in service was discussed by W. J. Merten, metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. By way of remedy, he recommended a uniform recrystallization at temperatures considerably above the transformation range to render the chain entirely safe for further service without resorting to a reduction of the safety load and basing the calculation of permissible stresses on the average cross sectional dimensions only.

Discussions to this paper were numerous. One speaker stated that wrought iron chain is made the same today as it was 100 years ago and expressed the belief that more complete heat treating could be undertaken with advantage. It also developed that the National Physical laboratory in England recommends a low-temperature anneal to overcome the effect of cold work.

Explains Tooth Failures

In a paper on metallurgical problems of transmission gearing, E. F. Davis, metallurgist, Warner Gear Co., Muncie, Ind., described the action of gear teeth in mesh and showed why tooth failures are not always attributable to metallurgical defects. Following a brief resume of the steps in making gears, the speaker mentioned modern furnace installations and compared different methods of heat treating.

Dealing with the decarburization of high-carbon steel in reducing atmospheres, J. J. Curran, metallurgist, and J. H. G. Williams, metallurgical engineer, Henry Souther Engineering Co., Hartford, Conn., reported that tests indicate that carbonaceous packing mixtures may be either carburizing or decarburizing in their action, depending upon the activating material used in the mixture and on the temperature of heat treatment. The conclusion reached by the authors was that packing materials used to protect steel during heating operations probably are responsible for skin softness after heat treatment.

J. P. Gill, chief metallurgist, Vanadium Alloys Steel Co., Latrobe, Pa., in a paper compared the properties of six steels of the high-carbon, high-chromium class which during recent years have become so popular as die steels. The comparison covered the critical points, hardening and tempering curves, microstructure and physical properties.

Failures of steel aircraft parts were analyzed by F. T. Sisco, chief of the metallurgical laboratory. Air Corps, Wright Field, Dayton, O., in an interesting illustrated paper. The discussion dealt with failures under the following classifications: Faulty manufacturing methods and not defective material; internal defects such as nonmetallic inclusions and the like; seams and other surface defects; defective steel including large grain size, segregation and banding; faulty or improper heat treatments; and welding.

Concluding this session was the presentation by title only of a paper, "On the Equilibrium Diagram of the Iron-Molybdenum System," by Takeshi Takei and Takejiro Murakami, Tokio Imperial university, Sendai, Japan. This paper was extremely technical in nature.

Prof. W. Trinks, Carnegie Institute of Technology, Pittsburgh, presided at the afternoon session at Commercial Museum at which time attention was focused upon heat treating furnaces and the heating of metals. Four papers were presented including one by R. G. Guthrie, metallurgist, Peoples Gas Light & Coke Co., Chicago, which concerned the effect of furnace atmospheres on steels. As a result of extensive observations, a number of conclusions were arrived at.

Reviews Furnace Progress

A review of progress made in the use of electric furnaces for heat treating was the substance of a paper read by A. N. Otis, industrial heating and welding engineering department, General Electric Co., Schenectady, N. Y. Specific applications referred to included furnaces for annealing tool steel bars and rods; and elevator furnaces for annealing sheet steel for electrical machines, the latter without the use of boxes. Among new development cited were electric furnaces for forging, continuous furnaces for the new process of copper brazing and furnaces for annealing in atmospheres of protecting gas.

In concluding, Mr. Otis said: "The development of electric heating has been a valuable contribution to the manufacturing industries, as an aid to improving quality, reducing cost, in providing better working conditions and enabling output per man to be increased. This art is relatively new, and appears to have vast possibilities for the future."

H. C. Knerr, consulting metallurgical engineer, Philadelphia, presented an interesting paper describing an electrically-heated salt bath method for heat treating high speed steel. Features of the method were listed as: Electrical heating with close tem-

All Groups Satisfied with Metal Week

TOTAL attendance at the National Metal Exposition was 64,870, exceeding slightly the attendance at Detroit last year, according to W. H. Eisenman, secretary of the American Society for Steel Treating. The American Welding society and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers both reported the heaviest registration and best meetings which their groups have conducted. The records reveal that 2714 members of the American Society for Steel Treating were registered as present in Philadelphia, this total representing slightly in excess of 50 per cent of the entire membership. Many exhibitors expressed themselves that the show was the most satisfactory in years. Announcement was made that the 1929 exposition and convention will be held in Cleveland, Sept. 9-13, with Public Auditorium housing the exhibits. It is regarded likely that the American Welding society and Institute of Metals again will co-operate by holding simultaneous meetings.

perature control which may be made automatic; use of a salt bath which does not give off fumes or attack tools; prolonged container life; less furnace deterioration; comfortable working conditions; low heating cost per pound of steel; ability to employ full hardening temperatures of approximately 2400 degrees Fahr. without injury to finished surfaces or cutting edges of high-speed steel tools. The development work on the new method was done in the metallurgical laboratory of Temple university, Philadelphia.

The apparatus and method for heating high-speed steel to between 2300 and 2400 degrees Fahr. in molten lead was described by Wilbur C. Searle, Leland-Gifford Co., Worcester, Mass. While the process was not claimed to be new, the author said it had not been presented in a paper before. Mr. Searle said: "This method of high-speed steel hardening is simple and very satisfactory for moderate production. There is little danger of destroying delicate edges before the tool is heated through." Structures obtained at 2200, 2300 and 2400 degrees Fahr. were shown.

Must Translate Science of Metal Treating

APPROXIMATELY 400 members of the society attended the annual business meeting Wednesday morning. In presenting his annual report, President F. G. Hughes reviewed the activities of the society during the past year and bespoke satisfaction of the progress in every department. He paid a tribute to the loyalty and efforts of the national officers and Cleveland office for efficient service. Committees also were commended for their accomplishments, particularly the recommended practice committee and its publication in bound form of the new *Handbook*.

In concluding, Mr. Hughes said:

"The American Society for Steel Treating is built upon a high ideal of service. It has grown because of its ability to give help and assistance. It has grown because it has uniquely filled a great need in industry and by bringing together the scientist and the practical man for the interchange of ideas and helpfulness, it has advanced the interests of both.

"This society from the beginning has been unique in its effort to combine the interests of the practical heat treater and the metallographist.

"If the American Society for Steel Treating through its efforts can translate the science of metal treating into practically improved tools, stronger and lighter forgings or castings wrought into new shapes of increased utility to better serve the needs of the world, then and only then will the American Society for Steel Treating have begun to justify its existence."

Secretary Makes Report

Secretary W. H. Eisenman reported that on Aug. 31 the society had a membership of 4844. Compared with the preceding year, this is a growth of 4.1 per cent. The financial status of the chapters is satisfactory and attendance at chapter meetings has been good. During the year two groups were promoted to chapters.

Mr. Eisenman reported an increase in the educational work of the chapters, with gratifying results. He commended briefly the work which John F. Keller, steel expert with the engineering extension department of Purdue university, did last year in educational work for the society. Similar work of organizing lecture groups had been undertaken again this year. The activity is self supporting.

During the year from Sept. 1, 1927 through Aug. 31, 1928, the 12 issues of *Transactions* have contained 82 papers requiring 2164 pages. Total editorial production for the first 14 volumes of *Transactions* is 13,256 pages.

Commenting on the *Handbook*, Mr. Eisenman said that the edition just issued contains 14 sections on 100 different subjects with a total of 593 pages. The present plans are to issue the 1930 edition probably in March or April of 1930.

In the report of treasurer, J. M. Watson stated that the society has made good progress during the year just closed and has further increased its reserve. He announced further that 41 per cent of all dues paid in by members had been refunded to the chapters and this constituted a record.

As chairman of the nominating committee, W. E. Ruder, General Electric Co., Schenectady, N. Y., submitted a report naming the candidates whose names are given in the accompanying box. Upon acceptance of the report, President Hughes introduced the nominees. A mail ballot will be taken this fall and the new officers will assume their duties Jan. 1.

Two amendments to the constitution were proposed by the constitution and by-laws committee through its chairman, H. J. Stagg, Halcomb Steel Co., Syracuse, N. Y. Both were passed. One provided for the payment of all dues as of March 1 and the other for suspension of membership after a 31-day period of delinquency.

President Hughes read to the meeting a telegram of greeting from the American Gas association, in convention at Atlantic City. The society replied to the greeting with one of similar felicitation. Mr. Hughes then presented to the Philadelphia chapter the bell and gavel which is awarded each year for assistance to the national office, excellence of organization, progressiveness and educational features. Dr. R. H. Patch, E. F. Houghton & Co., and chairman of the chapter accepted the token. The bell and gavel were given to the society in 1926 by President R. M. Bird. At this point in the proceedings, the meeting adjourned.

Officers Nominated

AMERICAN SOCIETY FOR STEEL TREATING

President

DR. ZAY JEFFRIES
Director of research bureau, Aluminum Co. of America, Cleveland

Vice President

R. G. GUTHRIE
Chief metallurgist, Peoples Gas Light & Coke Co., Chicago

Secretary

W. H. EISENMAN
7016 Euclid avenue, Cleveland

Directors

F. T. SISCO
Chief of metallurgical laboratory, United States air corps, Wright Field, Dayton, O.

A. H. D'ARCAMBAL
Metallurgist, Pratt & Whitney Co., Hartford, Conn.

Visitors Are Entertained

Visitors to Philadelphia were given an opportunity to see the industrial side of the city for no less than 17 plants in the vicinity threw open their plants for inspection. A number of the members and guests of the American Society for Steel Treating participated in the excursions, which were conducted on Tuesday, Wednesday, Thursday and Friday mornings.

Entertainment features of the convention program were limited to a ball at the Benjamin Franklin hotel on Tuesday evening, with several hundred couples attending, and a banquet on Thursday evening at the same place. Over 400 attended the latter function. Charles E. Carpenter, president, E. F. Houghton & Co., Philadelphia, presided as toastmaster and in his own inimitable manner filled the office in a most creditable way.

One of the formalities of the occasion was the presentation of the Past President's medal to J. Fletcher Harper, who directed the affairs of the society in 1927. The award was made

(*Concluded on Page* 986)

Progress in the Art of Welding Reflected at Fall Meeting

ADOPTION of a minimum program of testing joint pressure vessels, as suggested by S. W. Miller, chairman, procedure control committee, and the devising of standard ways and means for the testing of welds were the two outstanding accomplishments of the fall meeting of the American Welding society, Philadelphia, Oct. 8 to 12 inclusive. Announcement was made at the opening technical session that the Samuel Wiley Miller medal established in 1927 for the advancement in welding, will be awarded this year.

The first constructive attempt to develop rational working fiber stresses in welded structures was brought out at the Wednesday morning session when an empirical formula was presented. Delegates were urged to adopt the formula, at least until something better is developed. The annual banquet, at which E. J. Cattel, well known Philadelphian, spoke, was widely attended and was followed by a dance in the ballroom of the Bellevue-Stratford hotel. Final registration at the meeting exceeded 275 delegates. Numerous inspection trips to plants in and around Philadelphia constituted a popular feature of the convention program.

Devises Formula for Stress Determination

AT THE opening session Tuesday morning at the Bellevue-Stratford hotel, F. T. Llewellyn, U. S. Steel Corp., New York, and president of the society, presided and introduced H. A. Mackey, mayor of Philadelphia, who welcomed the members of the society to the city. A paper entitled "Erecting a Building by Welding," was presented by J. C. Lincoln, president, Lincoln Electric Co., Cleveland, in the absence of the author, J. F. Lincoln, vice president of the same concern.

The speaker asserted that in the near future beams will be supplied to the welding industry with a larger area in the center than at the ends. He described in detail various sketches of schemes suggested in the paper for connecting structural material in the field by welding and pointed out that there is a lack of trained personnel for doing welding work. Comment on the latter statement was made by F. M. Farmer, who cited a recent instance in the construction of an addition to a large hotel in Atlantic City, N. J., which was erected by other methods because of the time element involved in the assembly of the structural material.

In the discussion of Mr. Lincoln's paper, J. W. Owens, director of welding, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., pointed out that satisfactory welds are due in a large measure to trained operators. After describing the details of a training course conducted at his plant, he asserted that with proper plant equipment and trained welders it is almost impossible to conceive how consistent fusion could fail. Let the assembly gang erect as much of a building a possbile, he said, and then let the welders perform their work. He declared that while the industry has concentrated on trained welders the time now is ripe to specialize on the supervision of welders. At the close of the discussion two reels of motion pictures on "Automatic Arc Welding in Industry," were shown through the courtesy of the General Electric Co., Schenectady, N. Y.

Welding Automobile Bodies

F. M. Farmer, chief engineer, Electrical Testing Laboratories, New York, and past president of the society, presided at the afternoon session which was held at Commercial museum. J. W. Meadowcroft, assistant works manager, E. G. Budd Mfg. Co., Philadelphia, spoke on "Welding in the Automobile Industry" and presented two reels of motion pictures depicting the various fusion operations involved in the fabrication of steel automobile bodies. In the course of his remarks the speaker described a special spot welding machine, known as an oblique spot welder, for tacking an outside door panel to the inside frame of a body, which was developed because of the interior finish demanded by customers. The machine permits the making of welds at 32 points without putting heat marks on the steel.

The speaker stressed that in the operation of a flash welder a perfect fit must exist between the upper and lower dies at all times while the lower dies, connected directly to the transformer terminals, must be kept in perfect alignment. This point is essential, he stated, or the finish of the piece will reduce the strength of the flash welded section. Approximately 18,000,000 spot welds are being made daily in the company's plant and in assembling members of certain type bodies 1120 spot welds and 52 inches of gas welds are required. In conclusion the speaker predicted that in the near future the public will demand all-steel welded automobile bodies.

Additional information concerning the behavior of welds at elevated temperatures was presented by Professor Charles Moser, Leland Stanford university, Berkeley, Calif. After outlining the scope of the work sponsored two years ago by the San Francisco chapter of the society he discussed the practical properties of welds particularly the testing of four types of welding rods. In any discussion of welds, especially in regard to elastic properties of a welded joint, the speaker pointed out, the composite nature of the results must be borne in mind. The customary tensile specimen, taken across the weld, has certain marked advantages as an indicator of the strength of the bond between weld and plate metal but the elastic properties observed in such a specimen involve the fraction of the test length occupied by the weld, he contended.

Studies of the moduli of elasticity of welds and weld metal, Mr. Moser suggested, will greatly increase the knowledge of the process of weld failure. The proximity of two metals of radically different moduli undoubtedly sets up internal stresses under elastic formation. An extreme case of this, he stated, is the "V" weld with nonductile filling. This, according to the speaker, is unbalanced in that one side containing the greater amount of stiff metal will offer the greater resistance to deformation. At the close of the afternoon session a vote of thanks was extended the San Francisco chapter of

the society and Professor Moser for their untiring efforts in this field of research.

R. D. Thomas, chairman, Philadelphia section, presided at the technical session Wednesday morning at the Bellevue-Stratford hotel. The session was opened by J. S. Oechsle, president, Metalweld, Inc., Philadelphia, who spoke on "Running a Successful Job Welding Plant." The welding business, he stated, has suffered in the past from various operators and small companies endeavoring to do work that was entirely too large for their present plant equipment and knowledge. To do successful welding, the speaker contended, it is necessary that thousands of dollars be invested in the business. It is the company's policy, he said, to hire a man qualified as a combination welder, that is, one experienced in both electric arc and oxyacetylene welding. There is a varied amount of work in the job welding shop and often a man will go out prepared to do an acetylene welding job when an electric arc welding job is necessary.

An empirical formula for a working fiber stress and various tables for different values cited in the particular formula were presented by S. W. Miller, consulting engineer, Union Carbide & Carbon Research Laboratories, New York. This paper was discussed extensively. Its seems evident, the speaker stated, that the most important thing to be considered is that in service the structure must not permanently distort under any stress that may be applied to it. There are cases, the speaker explained, in which a reasonable amount of temporary distortion is permissible, and other cases in which such distortion should be limited. The measurement of the real ductility of weld metal is impossible in an ordinary welded tensile test piece, he declared, because the yield point of the weld metal in mild steel, when its tensile strength approximates that of the plate, always is higher than the yield point of the plate, so that during the tensile test, the base metal elongates and begins to neck down before the weld metal does.

As there seems to be no theoretical basis for a working fiber stress, he continued, it is necessary at present to depend on practical results for the development of any formula that would be used for this purpose. If certain fiber stresses have been used successfully with welds of certain tensile strength and elongation as measured by the bend test, the speaker contended, we can create a formula to cover these results. Of course the more figures available the more accurate will be the formula, which undoubtedly is true of any formula that is empirical; but an additional element of accuracy is the opinion of engineers based on their experience as to allowable fiber stresses for different kinds of welds. The tensile strength and elongation of such welds can be determined and the formula checked against them, he stated.

In opening the discussion F. T. Llewellyn stated that any formula for pressure vessels differs from stress formulas which apply to other types of structures. After explaining these differences, he declared that the formula presented by Mr. Miller is the first constructive attempt to develop rational working stresses. A need for a better ductile weld metal exists in the opinion of J. W. Owens for, as he explained, as soon as this is available the amount of reinforcement can be reduced and a saving effected. The session was brought to a close with further remarks from Mr. Miller, who recommended that inasmuch as stress is not a definite fixed quantity, that the formula be used at least until something better is developed.

Wednesday afternoon a large delegation was taken by bus to the Naval Aircraft Factory, League Island Navy Yard for the inspection of welding operations employed by the government. The committee on fundamental research met at 2:30 p. m. at the Bellevue-Stratford hotel.

Investigation of the work accomplished at a meeting of the joint pressure vessel committee of the society held last April was outlined at the Thursday morning session by William Spraragen, secretary, American Bureau of Welding, the research department of the society. E. H. Ewertz, consulting welding engineer, New York, presided. A report of the procedure control committee for the three sizes of tanks to be tested by the bureau of standards, Washington, was presented by S. W. Miller, chairman of the committee and the remainder of the session was devoted to the discussion of this report. The meeting culminated in the passing of a motion to the effect that the program committee be urged to adopt Mr. Miller's minimum program in view of the breather tests and the time and money required in assembling the various vessels for investigation.

Thursday afternoon delegates assembled at the lecture room, Commercial museum where the chairman,

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Looking down one of the aisles which contains a wide assortment of heat treating equipment

Interest at Metals Institute Meet Centers on Metallurgy

PARTICIPATING with the steel treaters and welding societies in National Metal week at Philadelphia, the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers last week held one of the most successful fall meetings of its long history. More than a hundred members and guests of the institute were on hand for the three-day program, which included a technical session on Tuesday, Wednesday and Thursday and a dinner Wednesday evening.

The dinner was one of the best attended and highly successful features of the convention. Dr. W. H. Hatfield, metallurgist, Brown-Firth Research Laboratories, England, George Otis Smith, president, American Institute of Mining and Metallurgical Engineers and many other prominent men were at the speakers' table. S. Skowronski, Baltimore Smelting & Refining Co., Baltimore, and chairman of the institute, presided. Dr. F. M. Becket, vice president, Union Carbide Co., New York, gave the principal address which was an elaborate historical account of the development and the wide use of chromium alloys.

W. M. Corse, secretary of the Institute of Metals division, told of his recent entertainment by the British Institute of Metals and of the acceptance by that organization of the invitation to meet with the American group in United States in the fall of 1932. Dr. Hatfield was asked to carry back to England an expression of the pleasure with which this announcement was received. Mr. Corse also announced that U. R. Evans of Cambridge university and world authority on corrosion would lecture here next February as guest of the Institute of Metals division.

He reported that the membership of the division has increased by 150 since the meeting a year ago, and announced that the symposium on corrosion will be held in February, 1929, at New York, that a symposium on secondary metals will be held in Cleveland in October, 1929, and that a symposium on the melting of metals is being planned for 1930.

Discuss Recent Progress in Science of Metals

DISCUSSION at the opening session was opened by O. W. Ellis, metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, who presented a paper on absorbability of gases in copper. Among other conclusions he found that the volume of gas occluded by solid copper is a function of the melting conditions and that the oxidation of copper in electric furnace melting practice may be prevented by addition of small amounts of carbon (1½ pounds of charcoal to a 150-pound charge). In discussing this paper S. L. Hoyt, research laboratory, General Electric Co., Schenectady, N. Y., questioned Mr. Ellis' conclusion that a definite ratio exists between carbon dioxide and carbon monoxide in solid copper based on temperature. Mr. Ellis replied that he also was surprised that the carbon dioxide did not break down at high temperatures but that the tests showed it did not.

T. S. Fuller, research laboratory, General Electric Co., Schenectady, N. Y., presented a paper describing the use of rare elements in the electrical industry. Argon, helium and neon are used in incandescent lamps. The annual saving to the public through the use of these elements is about $400,000,000. Tungsten for lamp filaments effects an annual saving of $2,000,000,000 compared with the same amount of light with the old carbon filaments. Molybdenum is used for electric furnaces. A lead-thallium alloy makes an excellent fuse material, releasing at a temperature above the melting point of either of the pure metals.

The constitution of the copper-silicon system was described in an illustrated technical paper presented by Cyril Stanley Smith, research laboratory, American Brass Co., Waterbury, Conn. In this he developed a new equilibrium diagram of the copper silicon alloys.

Diffusion Important Subject

The results of extensive experiments in the field of diffusion of zinc into copper were presented by Samuel L. Hoyt. This data, according to Zay Jeffries, Aluminum Co. of America, Cleveland, who discussed the paper, is the best of a quantative nature so far offered on the zinc carbon group. The subject of diffusion is important and fundamental in metallurgical work, he said.

Wednesday afternoon members of the institute participated with members of the American Society for Steel Treating in a joint symposium on metallography. A report of this session is presented in the account of the steel treaters' convention on page 979.

J. L. Gregg, Western Electric Co., Chicago, presented an unscheduled paper entitled "Dispersion Hardening in Copper and Silver Base Alloys" at the Thursday morning session. A paper on the effect of cold rolling and heat treatment on the physical properties of Britannia metal by B. Egeberg and H. B. Smith was read by Sam Tour, vice chairman of the session, in the absence of the authors. Both authors are metallurgists for International Silver Co., Meridan, Conn. Britannia metal is primarily an alloy of tin and antimony and its behavior under cold rolling and heat treatment differs from that of most other metals and alloys.

O. W. Ellis, metallurgist, Westinghouse Electric & Mfg. Co., East Pittsburgh presented a written disscusion of this paper in which he said the authors had contributed a valuable addition to metallurgy and that he was surprised the work had not been undertaken before. He said in his own work he had found that when Britannia metal was cold worked to give a reduction in section of from 10 to nearly 50 per cent annealing would produce softening. At about 50 per cent reduction he found no effect from annealing and at reductions above 50 per cent annealing produced a hardening effect.

"Stability of Aluminum and Magnesium Casting Alloys" was the title of a paper by A. J. Lyon, air corps, U. S. Army, which was read by F. Keller, Aluminum Co. of America, Pittsburgh. Mr. Lyon explains in

his paper that different properties are required for materials in airplane construction from those used otherwise. He told of the extensive study in this field made by the materials division of the air corps with particular reference to artificial aging. The subject is an important one and the paper brought fourth interesting discussion. R. S. Archer, Aluminum Co. of America, Cleveland said that age hardening properties are a definite advantage in that they permit assembling and adjustment of parts under more ductile condition of materials. He said, however, that time and temperature cannot be interchanged at will and that careful study must precede artificial aging.

E. M. Wise, research laboratory, International Nickel Co. Inc., New York, presented a paper on high strength gold alloys. This investigation is in a new and important field according to O. W. Ellis, who discussed the paper.

Develops Formula for Working Stresses

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A. G. Oehler, editor, *Railway Electrical Engineer*, introduced F. P. McKibben, consulting engineer, General Electric Co., Schenectady, N. Y. Mr. Kibben, in speaking on "Design of Welded Structures," explained that the articulation or joining together by electricity of various members in a steel building frame consists in developing the technique of welding and then adapting it to the industry. Designing engineers, he contended, now have available sufficient data, secured from reliable sources, to enable structural details to be designed with confidence. After discussing various building codes, the speaker described and showed by slides the different bearings, seats and connections employed in the erection of welded industrial buildings at Pittsfield, Mass., and Bridgeport, Conn. In conclusion he mentioned the advantages and cited applications of welding.

Invitation Is Received

Following this part of the program the chairman read a letter from the civil engineering section of the Engineers Society of Western Pennsylvania inviting members of the American Welding society and engineers to be present at a meeting on welding to be held at the William Penn hotel, Pittsburgh, Nov. 2.

Particular reference as to what happens to the surface of steel cut by oxyacetylene gas was made by D. E. Roberts, Linde Air Products Co., New York, in speaking on "Oxyacetylene Cutting in the Structural Field." He recounted the usefulness of the blowpipe for cutting structural members in the stockyard and declared that the portability of this apparatus saves considerable handling of stock in the process of fabrication. The author cited various tests run on steel which had been milled, sawed and cut by oxyacetylene gas and by means of photomicrographs thrown on the screen explained that the physical qualifications of the steel were not affected by the latter mentioned process. He declared that the surface of the steel is harder and more ductile when cut by oxyacetylene gas than in the original metal.

Welding in Airplane Industry

More than 5000 airplanes will be built in the United States during 1928, according to an estimate presented by H. L. Whittemore, bureau of standards at the opening session Friday morning at which J. H. Deppeler, past president of the society and chief engineer and superintendent, Metal & Thermit Corp., Jersey City, N. J., presided. Mr. Whittemore as co-author with H. H. Moss, engineer, development department, Linde Air Products Co., New York, of a paper entitled "Testing Joints for Aircraft Structures Prepared Under Procedure Specifications," explained that before a type certificate is granted by the Aeronautical branch of the department of commerce, the design of an airplane is checked by experts to determine whether it is airworthy. The bureau of standards has been requested to carry out this investigation and the speaker described the procedure followed.

He pointed out that in all types of military airplanes metal fuselage is used. Although mild carbon and chrome-molybdenum steels can be welded satisfactorily, he stated, the latter has almost displaced mild carbon steel because its strength is greater and due to air hardening properties the strength of the weld approaches that of the tubes. In the commercial field of airplanes, he continued, mild carbon steel tubing still is largely employed for fuselage construction but the tendency is to use tubing of alloy quality.

The speaker described the tests of typical joints of low-carbon steel tubing and was followed by the co-author, H. H. Moss, who decribed the preparation of the carefully worked out procedure for welding the specimens using oxyacetylene blowpipes.

An existing line of direct-current machines using castings cannot be changed over to the arc welded fabricated construction simply by replacing castings with similar fabricated constructions, without sacrificing many of the attractive possibilities which the new method of construction makes possible. That phase of the subject, "Standard Line of D. C. Machines Fabricated by Arc Welding," was brought out in the final paper at the session by the authors R. S. Marthens, mechanical engineer; C. C. Brinton, manufacturing engineer; and F. T. Hague, division engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The paper was divided into two parts. The engineering phase of the subject was presented by F. T. Hague and a description of the shop methods employed by C. C. Brinton.

The direct-current machine, Mr. Hague explained, is essentially one for specialized applications, and as a result, individual types of construction using castings have been developed for mill, hoist, marine and engine driven applications. The control of the design of shop tools and fixtures is an integral part of the design of the machines themselves. The problem of tools and fixtures is more difficult with fabricated steel parts than with castings, one of the reasons being the greater flexibility inherent in the fabricated designs. It is essential, Mr. Brinton emphasized, that this flexibility should not be restricted too greatly by shop tools and fixtures and it is frequently a problem whether to provide a universal fixture, or one of special construction.

To Standardize Test Methods

Standard methods for the testing of welds are to be devised by a special committee appointed by the executive committee of the American Bureau of Welding. This action was taken at a meeting of the bureau held Friday afternoon at the Bellevue-Stratford hotel. C. A. Adams, professor of engineering, Harvard Engineering school, Cambridge, Mass., presided. Progress report No. 6, which is a detailed report of several tests of welded rail joints, was presented by E. M. T. Ryder, vice chairman of the committee. L. H. Crook, department of machines, Catholic university, Washington, explained a report of an experiment to obtain information on the magnitude of the tension and compressive stresses in a steel plate adjacent to a welded seam. Other progress reports presented at this meeting dealt with pressure vessels by E. H. Ewertz, chairman of the committee; welding wire specifications, by W. S. Sprarogen; fundamental research by H. M. Hobart, chairman; and, structural steel welding by J. H. Edwards, chairman.

INTERIOR OF NEW GRAY IRON FOUNDRY BUILT BY THE CHICAGO PNEUMATIC TOOL CO., AT FRANKLIN, PA.

Completes Large Gray Iron Foundry

THE Chicago Pneumatic Tool Co., New York, recently has completed a large modern foundry at Franklin, Pa., where all gray iron castings for compressors and engines will be made. The buildings and equipment represent an investment of over $400,000. The equipment is modern throughout and consists in part of two cupolas, one with a capacity of 16 tons per hour and one with a capacity of 8 tons per hour; two rotary blowers; five traveling cranes, three of 15 tons capacity, one of 10 tons capacity and one of 5 tons capacity; several molding machines of various capacities from 1000 pounds to 20,000 pounds; four squeeze molding machines; three hopper type automatic sand handling units; mold drying ovens; yard cranes; two large and four small core ovens and miscellaneous equipment.

A daily capacity of 30 tons of castings is provided with ample provision for doubling this tonnage. The foundry building is 130 feet wide x 220 feet long and a storage shed also has been erected which is 60 feet wide x 330 feet long. This new foundry is adjacent to the main plant which consists of power plant, machine shop, erecting floors, pattern shop, offices and shipping platforms. The company also has large plants at Detroit and Cleveland.

Must Translate Science of Metal Treating

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by R. M. Bird, president in 1926. The second formality was the awarding of the Henry Marion Howe gold medal for the best paper published in *Transactions* during the past year. This distinction went to Oscar E. Harder and Ralph L. Dowdell, professor of metallography and assistant professor of metallography, respectively, University of Minnesota, Minneapolis, who jointly were the authors of the paper "The Decomposition of the Austenitic Structure in Steels," published serially in *Transactions* during the months of February to July, 1927.

The principal speaker of the evening was E. P. Warner, assistant secretary of the navy in charge of aeronautics, Washington. Dealing with the subject of aviation and most particularly the position of the United States, Mr. Warner said the progress of the last few years has been most gratifying. He predicted an increasing use of steel and nonferrous metals in airplane and airship construction and said that in the case of another national emergency it was easy to believe the country might face a shortage of certain alloys such as existed for certain timber materials in the World war.

Mr. Warner stated that the airplane industry never could parallel the automobile industry in its remarkable growth, nevertheless, it was making history. On the other hand, no considerable part of the metals production of the country would be required for that industry. Aircraft of the future will be almost entirely of the all-metal types. In closing he paid a tribute to metallurgists and heat treaters who had made it possible to adopt metal construction.

Open Hearth Authorized

Otis Steel Co., Cleveland, has authorized the construction of another open-hearth steel furnace, making the third to be constructed this year and giving the company a total of eight at its Riverside plant and five at its Lakeside plant. When the newly authorized furnace is completed, the annual capacity will be 840,000 tons.

Gear Manufacturers Assemble

American Gear Manufacturers Association Holds Semiannual Meeting in Buffalo — Many Interesting Technical Sessions Are Conducted

Committees Report Progress—Two Recommended Practices Approved—Joint Session with A. S. M. E. Machine Shop Practice Group

OFFICERS of the American Gear Manufacturers association were well pleased with the attendance at the semiannual meeting of the association held at Hotel Statler, Buffalo, Oct. 11-13. Six technical sessions were held in the three days during which a variety of papers were read and discussed. Committees, for the most part, presented only progress reports with the exception of one or two which submitted recommended practices for approval.

An interesting meeting was held Friday evening when members of the machine shop practice division of the American Society of Mechanical Engineers met with the gear manufacturers in a joint session at which problems of high-speed turbine gearing and a gear shaving process for production work were discussed following papers on these subjects.

Inspection trips were made to the Farrel-Birmingham Co. and the Lumen Bearing Co., both in Buffalo. Gear cutting machines were seen in operation at the former and a variety of methods of bearing manufacture at the latter.

The association approved the recommendations of the keyway committee for suitable key stock materials and the S. A. E. standards for more suitable limits and tolerances on spline shafts.

The spur gear committee presented a set of standardized spur gear tables to be used in determining the design of pinions having from 15 to 30 teeth and ½-inch bore. Considerable discussion was offered as to the use of the tables and further modifications which it might be necessary to make in them. Several changes in nomenclature were approved also at the suggestion of the nomenclature committee.

Plans are already under way for the spring meeting of the association which is the annual business meeting. Considerable standardization work is expected to be ready for approval by that time. Cleveland was selected as the spring meeting place.

Standardized Spur Gear Tables Discussed

COMMITTEE reports featured the opening session of the association. After the meeting was called to order and the members welcomed by President A. F. Cooke, the reports of the chairman of the various committees were presented. J. C. McQuiston, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., chairman of the publicity committee recommended a more general use of the AGMA monogram by the member companies of the association. He also suggested need for more photographs of the personnel of the organization.

B. F. Waterman, engineer, Brown & Sharpe Mfg. Co., Providence, R. I., first vice president of the association and chairman of the general standardization committee, reported a continuation of this committee's progress in the work on revision of the keyway system for 14½ to 20 degree full-depth involute systems. Further improvements on the nomenclature of bevel, herringbone and external spur gears were also considered by this committee.

J. L. Williamson, Fellows Gear Shaper Co., chairman of the spur gear committee, introduced L. F. Burnham, R. D. Nuttall Co., Pittsburgh, who presented the report of this committee. A lengthy set of tables for determining the design of pinions of from 15 to 30 teeth, and 0.5-inch bore, which had been drawn up by the spur gear committee, was explained by Mr. Burnham. The tables were of a highly technical nature and the result of considerable work on the part of the committee. Figures were calculated on bases of 4000, 6000 and 8000 pounds per square inch torsional shaft stresses. In preparing the tables known as standardized spur gear tables, certain specific values were adopted, such as those for maximum tooth stress, pitch line velocity, fiber stresses of various materials, face widths and minimum shaft diameters.

Argue Value of Tables

Considerable discussion ensued in which the consensus of opinion of the members seemed to be, as Mr. Waterman stated, that "the greatest value of the tables was in the reasoning methods and that further modifications could be made by altering specific values which had been used originally." It was also thought that the results of Prof. Earle Buckingham in the work which he is carrying on at Massachusetts Institute of Technology on the wearing qualities of gears would have some influence on the values of the tables.

C. B. Hamilton Jr., Hamilton Gear & Machine Co., Toronto, Canada, read the report of the metallurgical committee on the subject of alloy steel specifications for gears. The report was a summary of replies to a questionnaire on alloy steels for gears which had been sent to a number of gear cutting machine manufacturers, other machinery manufacturers and steelmakers. Due to the tardiness with which the replies were received, time was not available to prepare a written specification to be adopted in the meeting of the gear manufacturers. This will be done at the next meeting, however. The replies received showed the preferences of various manufacturers for certain S. A. E. steels in the fabrication of gears. The complete report will be brought up at the next meeting for adoption as a recommended practice.

Two recommended practices were adopted at the suggestion of the keyway committee whose report was presented by R. B. Zerfey, Tool Steel Gear & Pinion Co., Cincinnati. The first was in regard to key stock materials. It was decided that, except for special cases, steel of 0.10 to 0.20 per cent carbon was suitable for the key stock. The second recommended practice was in answer to a need for more suitable limits and tolerances for spline shafts. The committee suggested that the present S. A. E. stand-

ards were satisfactory and it was voted to accept these standards as being approved by the American Gear Manufacturers association. The keyway committee reported further progress work on keyways for special keys and figures for key strength.

D. T. Hamilton, Fellows Gear Shaper Co., Springfield, Vt., chairman of the nomenclature committee, presented the report of this committee. Two changes in spur gear nomenclature were put before the members and accepted. The term normal involute with reference to pitch was changed to base. The definition of backlash was changed to read the "shortest distance between nondriving surfaces of mating teeth." With regard to bevel gear nomenclature the committee stated that consideration was to be given to the suggesions for improvement of bevel gear nomenclature which had been adopted at the previous meeting of the association. Other committee reports took the form of progress reports; no radical or important developments were presented.

Speaking before the Thursday afternoon session, J. F. Lincoln, president, Lincoln Electric Co., Cleveland, predicted that within the next ten years "a great increase would be seen in the use of welded steel in structural and fabricating work." Mr. Lincoln presented a paper entitled, "The Effect of Arc Welding on Manufacturing." Using a number of lantern slides to illustrate the various points which he made, Mr. Lincoln pointed out the savings in cost which could be effected by the use of welded steel and and claimed that there were many fields of manufacturing and fabricating in which this process can be applied advantageously. In particular, the speaker emphasized the advantages of automatic arc welding, some of them being higher speed in the welding operation and purer metal in the weld.

"The Niagara Frontier," was the title of the paper which was offered at the Thursday evening session by Maj. Theron M. Ripley, assistant Erie county engineer in direct charge of road development and general traffic. "International city" was the term which Major Ripley said he would prefer to be applied to the Buffalo district rather than the Niagara frontier. Major Ripley said, in part:

"A city of 700 square miles, made up of scores of communities wholly independent in the management of their own political affairs but all contributing to the business and commercial success of all the others. The 400 square miles on the New York side already have developed into a metropolitan area with a production of a billion dollars in value every year. The 300 square miles in Canada are available for tremendous expansion."

The great part which development of the automobile has had in this welding together of Canadian and American interests in the Niagara district was especially emphasized by the speaker. An informal discussion followed Major Ripley's remarks after which the meeting proper was adjourned and a technical standards meeting was held. The purpose of this session was for each committee to get together and formulate plans for intensive work in the time intervening between this fall and the annual meeting next spring, actually accomplishing, where possible, some of the work to be done during that period.

E. J. Frost Is Elected Honorary Member

AT A MEETING of the executive committee of the American Gear Manufacturers association held previous to the opening session a recommendation was made that E. J. Frost, president of the association for the year 1927-28, *be elected to honorary membership. Acting upon this suggestion, the membership of the association unanimously supported the motion and Mr. Frost was so elected. Until recently Mr. Frost was president of the Frost Gear & Forge Co., Jackson, Mich., but had tendered his resignation to the gear manufacturers association after he had sold his interests in the company and no longer was engaged in the gear business. He has been active in the affairs of the association since its organization in* 1917. *This is the first honorary membership established by the gear manufacturers and Mr. Frost's election to it is a signal recognition of the high regard which members of the association hold for him.*

See Need for Impersonal Measuring Devices

IN A PAPER, "Predetermining Quality Gearing," Russell M. Coldwell, Fellows Gear Shaper Co., Springfield, Vt., pointed out the need for impersonal measuring instruments in gear checking. Quality gearing, as defined by Mr. Coldwell, is that gearing which embodies a high mechanical efficiency, a capacity to transmit high loads and quietness. The paper was, in effect, a discussion of measuring instruments designed to maintain and predetermine quality in gearing.

The speaker declared that standards of precision are being raised constantly and to meet these standards new measuring instruments are being developed to assume positive control of machine tool production. As regards gearing there are two types of measuring instruments. The first is the elemental type which measures such characteristics as tooth position and tooth shape. Several of these elemental type measuring instruments were shown by means of lantern slides and explained by the speaker. The second type of device is the integrating measuring instrument, in which the elemental errors of gears are integrated to show the effect of a combination of errors in actual usage.

Joint Session Is Held

At the joint session of the machine shop practice division of the American Society of Mechanical Engineers and the American Gear Manufacturers association, held Friday evening, Ira Short, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., presented a paper entitled, "High Speed Turbine Gearing." The speaker stated that steam turbines, in order to attain their maximum efficiency must operate at comparatively high speeds and, for the same reason, some of the apparatus which they drive must operate at slower speeds. Some method of speed reduction must therefore be employed, and in order for it to be successful it must be efficient, silent in operation and reliable.

Continuing, Mr. Short described with the help of lantern slides several speed reduction units which had been made and used by the Westinghouse company. He advanced theories to account for various types of wear of gear teeth and the corrective measures applied. Proper lubrication of gears, gear noises and their elimination, and the importance of correct alignment were other phases of the subject which were outlined by the speaker.

Following the paper by Mr. Short, H. D. Tanner, Pratt & Whitney Co., Hartford, Conn., presented an address,

"The Pratt & Whitney Gear-Shaving Process," in which he described with the aid of a series of lantern slides and a short moving picture a gear-shaving process which was the invention of James H. Barnes, Dayton, O., and which the Pratt & Whitney company with the aid of the Chrysler Corp., Detroit, has developed. The process is a practical method of generating involute spur or helical gears at 0 degrees.

In the actual machine a large cam, with two opposed involute and two cam rolls are used. Two cutting tools are also employed; the gear is revolved in alternate directions, the cutting tools being upright and adjacent to each other and moved in such a way that as the gear is turned in one direction, one cutting tool makes a cut on a tooth. When its cut is complete, the gear is reversed and the adjacent tool makes its cut. Features of design which Mr. Tanner described in detail were the master cam and a novel indexing device. The gear-shaving machine is said to be especially applicable to the production of small gears in quantity lots, such as required by the automobile industry.

Abrasives Considered

Although gears and gearmaking methods have been given considerable thought and attention for many years, the process of gear lapping practically has been neglected, according to H. J. Willis, research engineer, Carborundum Co., Niagara Falls, N. Y., who presented a paper, "The Manufactured Abrasives in Gear Lapping," at the Saturday morning session. Mr. Willis reviewed the various abrasives used in gear lapping, such as ground glass, crystalline alumina, tripoli, corundum and carbide of silicon. This list includes both natural and manufactured abrasives; the speaker stated that the manufactured abrasives were considered the best for gear lapping.

Consideration was given also to the vehicle for carrying the grain. A finishing compound which wos claimed by the speaker to embody all the desirable features of abrasive and a vehicle has been manufactured by the Carborundum company and used for a number of years. Mr. Willis gave the experiences of his company in the use of this finishing compound.

A number took advantage of an inspection trip to the Farrel-Birmingham Co., Buffalo, Friday afternoon. A variety of machines for cutting herringbone gears of all types and sizes were seen in operation.

Plans Installation of New Car Dumper

Plans for a new electric car dumper, expected to set a new record for speed, have been completed by the Toledo & Ohio Central railroad. The new dumper will be built by Heyl & Patterson, Pittsburgh, and is expected to be completed in March, 1929. It will be located at Toledo adjacent to the first all-electrical car dumper installed on the Great Lakes, also owned by the Toledo & Ohio Central railroad.

The new dumper will be of the lift and turnover type with a variable dumping position which permits the car to be raised and dumped at any height between the maximum and minimum pin positions. The mule haul will be driven by two 500-horsepower, shunt wound, direct-current motors, and the cradle will be driven by two motors of the same type and rating. Both alternating and direct-current motors will be used on the dumper, the total equipment involving an aggregate of approximately 3000 horsepower. Electrical equipment is being furnished by the General Electric Co., Schenectady, N. Y.

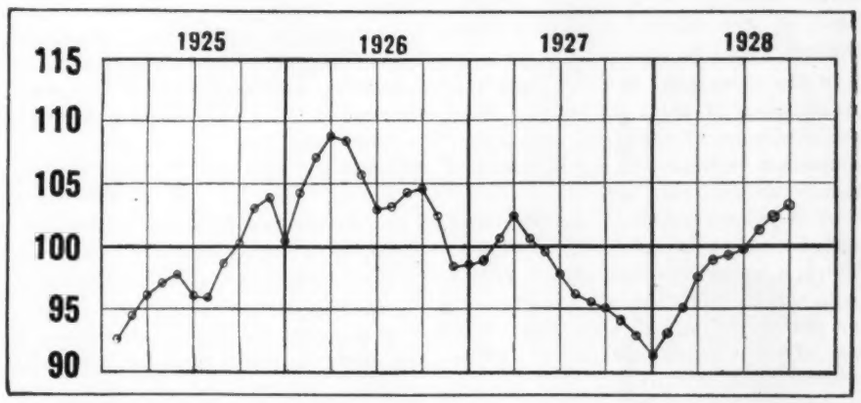
Advocate Cost System

Directors of the American Foundrymen's association recommend to all steel foundries the cost system adopted by the Steel Founders' Society of America and to all malleable foundries the cost system adopted by the Malleable Iron Research institute. The board also recommended that the Gray Iron institute be encouraged to develop a cost system for gray iron foundries. Members of the association are being circularized for suggestions and comments on a cost system for nonferrous foundries and for members of a nonferrous subcommittee of the American Foundrymen's association committee on costs. In 1926 this cost committee formulated standard cost divisions for a foundry cost accounting systems which are applicable to all branches of the foundry industry.

Propose New Alliance of Distributor Groups

At a meeting, Sept. 27, of the officers, members of the executive committee and advisory board of the National Supply and Machinery Distributors' association, an invitation was extended to the Southern Supply and Machinery Dealers' association to unite with the National association in one strong distributors' association. Recently members of the National association voted against a proposed amalgamation of the National and Southern associations with the American Supply and Machinery Manufacturers' association on the grounds that constructive co-operation and harmony could not be obtained through an amalgamation of distributors and manufacturers. A formal invitation to the newly proposed alliance has been forwarded to officials of the Southern association who are expected to act upon it shortly.

Metal Trades Employment Is Gaining



EMPLOYMENT in the metal trades represented by the National Metal Trades association has moved steadily upward since the beginning of the year, as shown by the accompanying chart, prepared by the association from its district reports. Present employment is at a higher point than in any quarterly period of 1927. The base line, 100, is the monthly average of the employment in the year 1925, 1926 and 1927. Thirty-five charts, representing the employment trend in individual cities and districts, also are issued by the association, from which the composite chart is prepared.

Hold Fuel Conference in Britain

Engineers of Great Britain, France, Germany and United States Convene in London to Discuss Questions Relating to Heat and Power

SEVERAL of the 170 papers presented at the World Fuel conference, which closed in London, Oct. 5, were of special interest to the iron and steel industries. In the carbonization industry section, the paper on "Coke Quenching and Cooling," by W. Colquhoun, Great Britain, contained the statement that the method of remote quenching used at most American plants and now coming into vogue in Europe is most suitable for modern high-speed coking plants. Blast furnace operators demand above all a constant moisture content, and water quenching is satisfactory provided that this requirement is maintained. The necessary plant for dry cooling is high in first cost, and only economic when a satisfactory credit can be obtained from the steam raised.

Discuss Handling of Coke

W. S. Edwards, Great Britain, in a paper entitled "Coke Screening," said that only recently the special nature of coke has been taken into account in designing screening plants. Special attention was called to the method of handling the coke after leaving the screens. F. W. Goodenough, Great Britain, presented a paper on "The Gas Industry as a Source of Domestic and Industrial Energy." He showed that if raw coal be carbonized and the coke converted into electricity, then as gas and electricity there would be available about 115 therms per ton, whereas if the raw coal had been burned directly for electrical generation, at the most only half that amount would be available.

In the discussion that followed the presentation of these papers, R. May, vice-chairman of the section of carbonization industry, said that remote quenching of coke is evidently the most popular method at present, and that he concurred with that opinion. The dry method, in view of its initial cost, can be confined only to particular plants and particular areas. The rest of the discussion centered on the utilization of surplus gas both in the works and outside the works.

In the section devoted to the utilization of fuels, including electricity, for industrial work, Sir Robert Hadfield and R. G. Sargent, Great Britain, contributed a paper on "Industrial Heating by Solid, Liquid and Gaseous Fuels," in which the authors showed that today heat-resisting steel can be made which can stand more than 1000 degrees Cent. without oxidation. Recently such steel has been made with a definite resistance to the action of sulphur at such a temperature. This steel can be used in mechanical stokers and recuperators.

A paper by Dr. Bansen, Germany, was titled "The Production and Utilization of Gas in German Iron and Steel Works." The author showed how gas is used to its full extent in all the processes connected with the works, including generation of electricity, although he considers that coal is best used for electric generation and for rolling mills. The works must be designed to produce equilibrium between gas supply and gas consumption. Dr. Bansen advocates coke ovens heated by purified blast furnace gas at constant pressure. The whole of the coke oven gas should be used in the steelworks and rolling mills. Open-hearth furnaces should be heated by a preheated mixture of blast furnace and coke oven gas. It is claimed that every requirement of heat supply and of output can be met in heating furnaces by the use of blast furnace gas with or without preheating, and with or without the addition of coke oven gas.

Electric Heating Sasitfactory

"Industrial Electric Heating," was the title of the paper by S. E. Monkhouse, Great Britain, in which the author pointed out that in Great Britain electricity is mostly generated from coal. The general experience in industrial heating is that although the cost of the actual heating is greater than with fuel, the results are so satisfactory, especially in heat-treating processes, that its use is extending. The American Technical committee presented a paper entitled "Utilization of Electricity for Industrial Heating." It is estimated that in the United States some 2,000,000 kilowatts of electricity is being used for industrial heating, representing a little more than 10 per cent of the electric motor load.

W. O. Renkin, United States, presented a paper on "Powdered Fuels in Metallurgical Works," in which he emphasizes the fact that, unless a coal has been thoroughly well dried, it is useless to grind very finely, as the particles agglomerate on injection into the furnace. This is particularly important in the melting of malleable iron. It seems probable that oil-fired open-hearth steel plants will change over to pulverized coal firing, fuel consumptions of 400 pounds of coal per ton of steel having been attained. The application of pulverized fuel-fired furnaces to puddling and bushleling also is likely to extend.

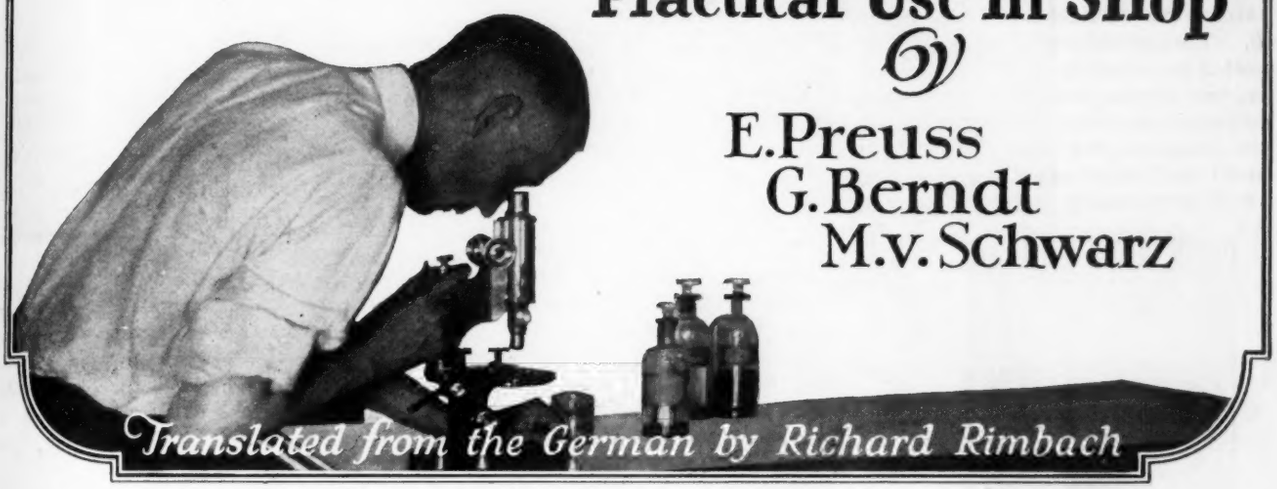
Waste heat recovery was covered in two papers. In the paper entitled "Waste Heat Recovery," by F. G. Bailey, Major W. Gregson and J. Reber, Great Britain, considerable data was given showing the amounts of steam which can and are being obtained from waste heat boilers applied to a number of well-known industrial processes. It is stated, for instance, that in a steelworks it is practicable to raise 3000 pounds of steam, or about 200 horsepower, per ton of finished steel from the waste heat from open-hearth furnaces, soaking pits and reheating furnaces.

Closer Co-ordination Needed

In the section on economic possibilities in the better co-ordination of fuel utilization, two papers were presented, one, "A Fuel Policy," by Sir Arthur Duckham, Great Britain, and the other "Co-ordination Between Blast Furnaces, Coke Ovens and the Martin Furnaces in a Metallurgical Works," by C. Berthelot, France. Both authors advocated closer co-ordination between iron and steelworks and coke oven plant. Sir Arthur considers that the best economy would seem to be to erect coke ovens at the blast furnaces of sufficient size that the coke oven gas, together with the blast furnace gas, will provide all the heating requirements of the joint operations of coke ovens, blast furnaces and steelworks. The remaining coke required for the blast furnaces would be purchased from outside.

M. Berthelot puts forward some interesting facts relating to electric power production in a steelworks. An isolated works, in order to be able to meet peak loads has to install so much power plant that it usually is working at 65 per cent load. But by linking up a number of works the reserve power can be reduced so that the load factor is increased to 75 per cent.

Metallography Simplified for Practical Use In Shop



By
E. Preuss
G. Berndt
M. v. Schwarz

Translated from the German by Richard Rimbach

Chap. VI—General Grinding, Polishing and Etching of Samples. The Metal Microscope (Concluded)

POLISHED samples prepared in the manner previously described, now are ready for the investigation under the microscope. The observation is started with the naked eye and the hand lens, using as small microscopic magnification as possible to obtain correspondingly large fields of observation. In this way the general picture typical for the structure in question is determined. Not before the polished surface is investigated in all places is a higher magnification used, if such a magnification is really necessary. In most cases a magnification of 40 to 200 diameters will be sufficient; only in few cases, as for example in hardened and heat-treated steels, is a higher magnification chosen. A simple and correspondingly inexpensive microscope is sufficient to obtain all the information necessary for practical purposes.

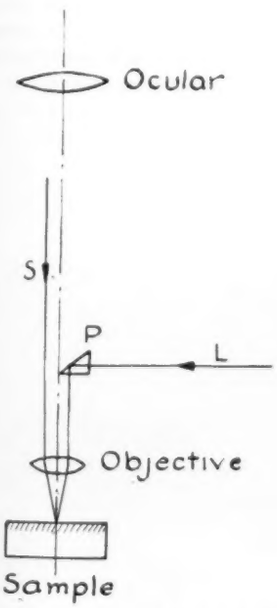


Fig. 66—Path of the rays in the metal microscope

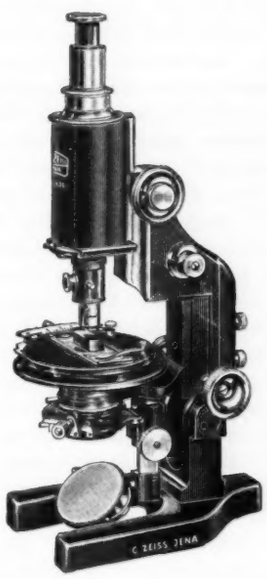


Fig. 67—Workshop microscope manufactured by Carl Zeiss Inc., New York

The observation with transmitted light, as used in the microscopic examination of bacteriological slides or thin mineralogical sections, is of course not possible in the case of metal samples, because they can not be prepared thin enough to transmit the light; therefore, they must be examined in reflected light. The illumination takes place by oblique light or when high magnification is absolutely necessary, by means of the vertical illuminator. This is a small mirror or a total reflecting glass prism, *P*, which is located in the tube of the microscope above the objective as shown in Figs. 68 to 71. The bundle of light rays, *L*, coming from a small electric lamp is thrown by the prism,

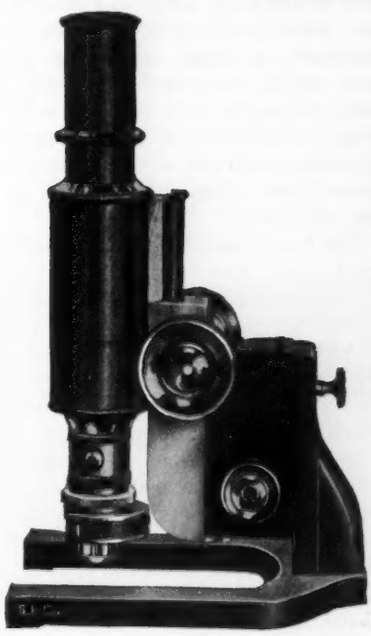


Fig. 68—Jointed microscope manufactured by Spencer Lens Co., Buffalo

P, through one-half of the objective upon the examined surface and serves in this way for the illumination, while the other half develops a picture, which is observed as usually through the ocular. In place of the incandescant lamp a mirror can be used which throws the sunlight upon the prism, *P*. The incandescent lamp is connected to a battery of three dry cells or two storage cells. If alternating current is available, it is better to have the lamp supplied with current by a small bell transformer which is fastened permanently on the carrying case of the microscope to permit plugging an extension into an outlet. Furthermore, a small regulating resistance should be connected ahead of the lamp, to regulate its brightness as desired. A microscope should have two objectives and two oculars, to be able to use any magnifications from 30 to 250 diameters.

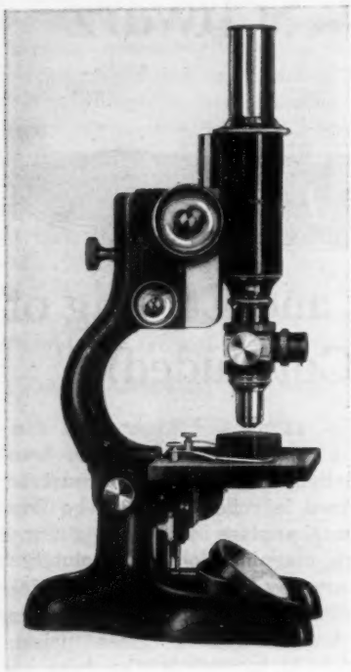


Fig. 70—Workshop microscope manufactured by Bausch & Lomb Optical Co., Rochester, N. Y.

For the investigation of metal sections every type of microscope, which has a suitable vertical or opaque illuminator, can be used. Often, however, it is not possible to take a sample for the preparation of the polished section, as the material would be destroyed.

The proper method of procedure is to prepare the particular area on the material for metallographic examination. To be able to bring the microscope in proper position to the polished sections, which often are large pieces, and, to set it up in the required way, the instrument should be adjustable in every direction. Such a microscope, adapted to plant use is shown in Fig. 69. It is equipped with a fine adjustment and permits a quick change of the magnification by revolving the objective nose piece. The usual samples are on the hemispherical table and can be brought to any desired position.

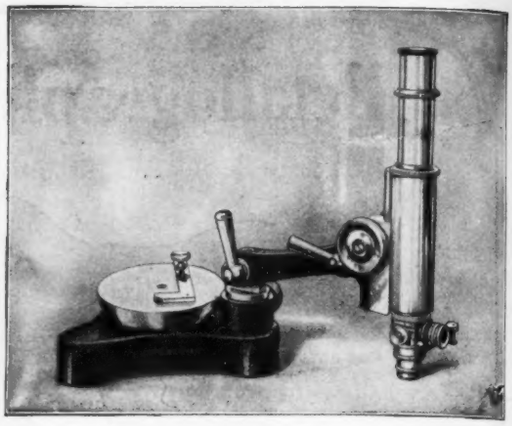


Fig. 69—Jointed microscope manufactured by E. Leitz Inc., New York

If the piece, which is to be investigated, has a sufficiently large surface, then the microscope can be set directly on it as shown in Fig. 68. A construction, which deviates from the types used at present, is shown in Fig. 71 by the metal microscope of Zeiss, which was developed especially for the examination of whole pieces and construction parts especially of shafts. The light coming from the light source passes through a prism and one-half of the objective upon the surface to be examined; here it is reflected and after passing through the other part of the objective, is turned by another prism horizontally to the ocular. On shafts it is mounted by two jaws which can be adjusted.

If the observed structure is to be reproduced in a photograph additional accessories are required, such as a projection or periplane ocular, above which the photographic camera is mounted usually horizontally on a suitable stand.

For photomicrographs the large metal microscopes with a built-in camera are suitable. The arrangement given by Le Chatelier is of advantage. The sample is placed on the bored object table with the plane, which is to be investigated, downward. The light rays for observation and photography are turned in a horizontal direction by a mirror or a total reflecting prism.

Level samples can be placed directly under the microscope. Uneven samples are mounted with a little wax on a piece of glass and then are leveled in such a way that the polished surface is perpendicular to the axis of the microscope, thus bringing the whole field of observation in focus. Samples can be mounted conveniently on pieces of pipe cut off level at heights of 1, 1½, 2 and 3 centimeters. The pieces are placed on a glass plate; then the polished section with the wax is placed on the glass plate; and finally, the whole is pressed down by another glass plate until it touches the ring. This procedure is strongly recommended in the observation of large surfaces because the focus of the image under the microscope need not be changed for every position.

The measurement of the magnitude of the objects observed under the metal microscope is accomplished by a measuring ocular which has a small subdivided scale. By adjusting the eye-piece it is first brought into focus; then it is fixed on the section by

(*Concluded on Page* 1028)

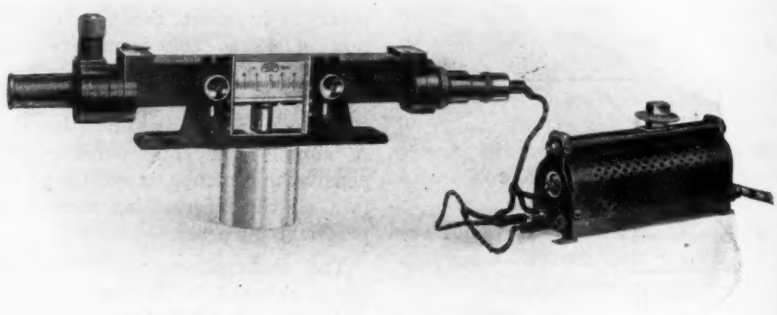


Fig. 71—Metal microscope manufactured by George Scherr Co., New York

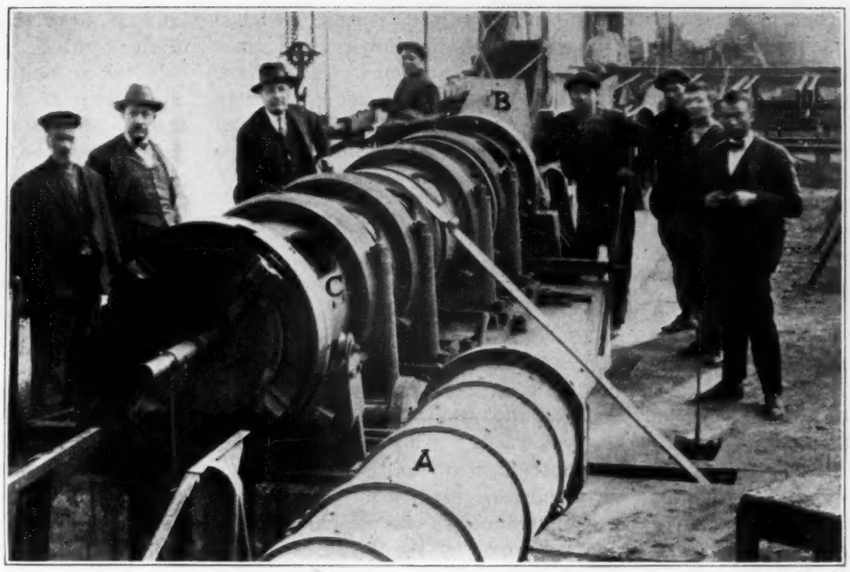


Fig. I.—*The permanent mold machine as designed by Possenti and Scorza*

(A) shows the flask, (B) the pouring basins, and (C) the spinning center

Improve Process for Casting Pipe Centrifugally in Green Sand Molds

By Giuseppe Guerrini

MANUFACTURE of cast iron pipe by the centrifugal method has become a problem which keenly interests those specializing in foundry work. The principle of casting metal by centrifugal means is not new since early in the nineteenth century an Englishman named Eckhardt attempted the centrifugal casting of pig iron by causing a sand mold to revolve.

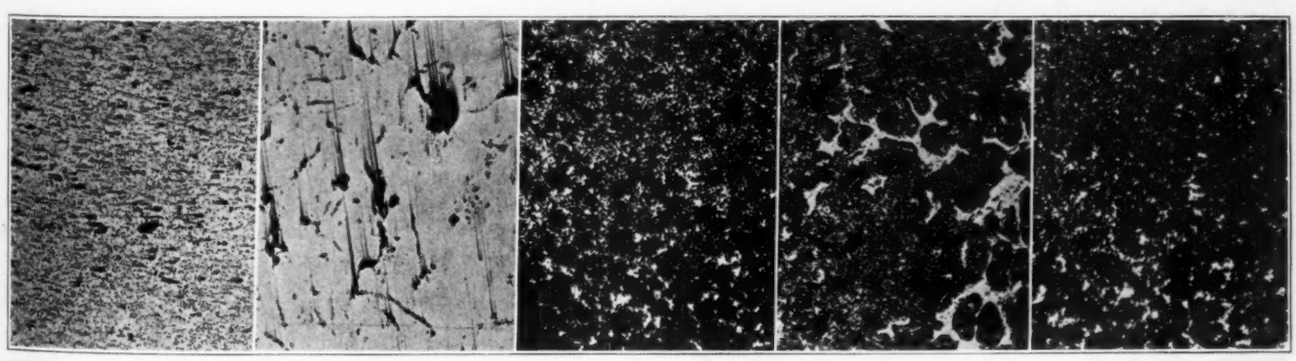
Results obtained were neither practical nor economic, due perhaps to the fact that physical, chemical and mechanical knowledge at the time was not sufficently appreciated in foundry work. The old school did not know how to translate practical knowledge of various sands and pig irons into figures which would indicate the chemical analysis, resistance, permeability, and cohesiveness of the sand.

Early in the twentieth century, 100 years after Eckhardt's experiments, the problem of making cast iron pipe by centrifugal methods was approached again from quite a different angle, using a metallic or permanent mold in place of a sand mold. Practical results were obtained from patents of two Brazilians, Arenz and De Lavaud. Later other advances were made by American, British, German inventors and an Italian engineer, Ercole Galassini, whose process is being used by an important metallurgical establishment in Italy.

The quality of the metal used for making the permanent mold exerts an enormous influence on the manufacture of pipes cast by the centrifugal method. Attention of technicians has turned to this point and has resulted in experiments upon the use of permanent molds made of tungsten steel.

Recently, developments have been made in the centrifugal casting process for which two Italians, Engineer Possenti and Mr. Scorza, and an American, W. D. Moore, are responsible. These inventors again took up the work of Eckhardt, with the help of modern mechanical methods, and although working along different lines they arrived at interesting solutions of the problems.

Both the methods of centrifugal casting, namely the permanent mold and the sand mold are based upon the same principle, namely the pouring of the molten metal against the wall of a mold to which rapid rotation



CENTRIFUGALLY CAST BY POSSENTI-SCORZA PROCESS

Fig. 2—Distribution of Graphite—Unetched—X 9. Fig. 3—Graphite Distribution—Unetched—X 90. Fig. 4—Pearlitic Structure—Etched—X 9. Fig. 5—Ferrite in Ground of Fine Pearlite—Etched—X 90. Fig. 6—Phosphide Distribution—Etched—X 9

is imparted by some mechanical means.

Advantages are claimed for the centrifugal process of casting pipe, including saving of time owing to the elimination of the central core, and a uniform thickness of metal. In addition an appreciable increase in the mechanical strength of the metal over other methods of manufacture is claimed. The most important point gained by the centrifugal method of casting is the uniform distribution of the whole quantity of metal all over the mold.

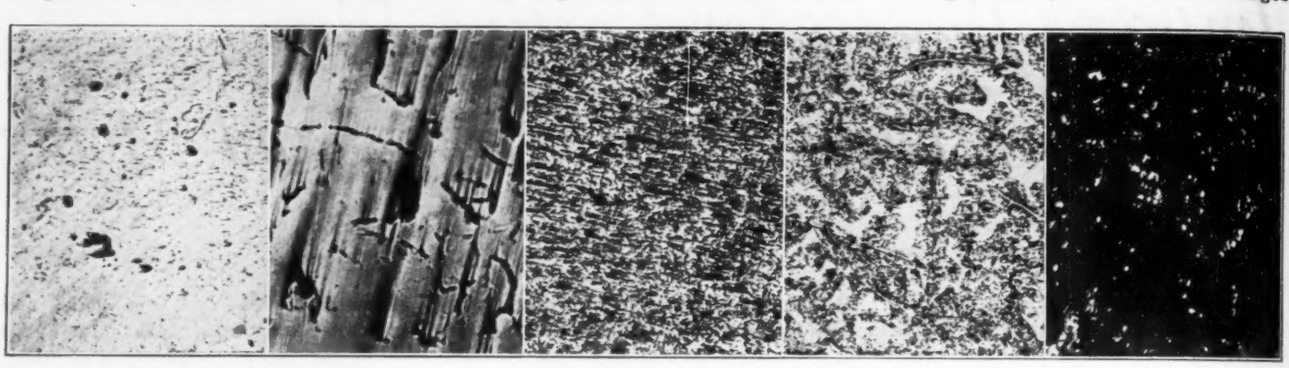
In casting centrifugally in sand molds, the problem of the distribution of the metal is rather more complicated. Apart from the uniformity required for the good distribution of the metal over the whole length of the mold, it also is necessary to carry out the work almost instantaneously to prevent deformations of the mold. the new plans will permit a large production with low labor costs since practically all movements now have been made automatic. It is expected that with the improvements introduced it will be possible to manufacture pipe in 5 to 8 minutes, depending on the diameter.

The plant for centrifugal casting used at Pesaro comprises a compressed air molding machine upon which one or four flasks are placed to form the molds. The flask is of a special design, a portion of it being detachable, so that after the metal has been cast centrifugally that portion may be removed easily. This is accomplished automatically so that the pipe may be withdrawn readily.

The compressed air machine is of the type made by the Tabor Mfg. Co., Philadelphia. It has a lifting capacity of 17,600 pounds and was constructed This is important since the number of flasks used in limited.

Metal is melted in a cupola having a capacity of 5 tons per hour. This cupola also supplies the metal required for the various departments of the Pesaro Foundry Works. Charging the cupola is under rigorous control. The charge consists of carefully weighed quantities of No. 3 Luxemburg iron, medium phosphorus Scotch iron, and machinery scrap which produces a grade of iron suitable for the pipes cast.

The chemical analysis of pipe produced is as follows: Total carbon 3.20 per cent; graphitic carbon 2.80 per cent; combined carbon 0.40 per cent; silicon 2.33 per cent; manganese 0.73 per cent; phosphorus 1.28 per cent; sulphur 0.064 per cent. When tested for tensile strength, five bars having an analysis as shown averaged



PIT CASTING PROCESS

Fig. 7—Graphite Distribution—Unetched—X 9. Fig. 8—Graphite Distribution—Unetched—X 90. Fig. 9—Pearlitic structure—Etched—X 9. Fig. 10—Ferrite in Ground of Fine Pearlite—Etched—X 90. Fig. 11—Phosphide Distribution—Etched—X 9

The method developed by Possenti and Scorza is used at present at the Foundry Works of the Montecatini Co., Pesaro, and at the important Necchi Foundry, Pavia. Other plants have been installed in Spain, France, Belgium, Holland, Brazil, the Argentine and Germany. The plant at Pesaro is small and consists of the orignal machine invented by Possenti and Scorza. This machine which is shown in Fig. 1, is capable of producing centrifugally cast pipes having an internal diameter ranging from 7.87 to 13.78 inches and up to 13 feet in length.

With 12 flasks it is possible at that plant to produce from 5 to 7 tons of pipe in 8 hours. Rejections, which are not due to any defect in the principle but rather to lack of attention on the part of the workers, represents something like 3 to 6 per cent.

The Pesaro plant was constructed on the first Possenti-Scorza patents and it furnishes a demonstration of the method. An examination of the latest designs prepared for the Necchi Foundry and for installations in France, shows that these are of great simplicity. The machines designed on at Frankfort, Germany, by the firm of Kretschmer. When the mold has been formed and laid horizontally, its face immediately is covered with a layer of special blacking, finely spread, while an electric heater dries the moisture to a certain depth in the mold. This procedure is known as skin drying in the United States.

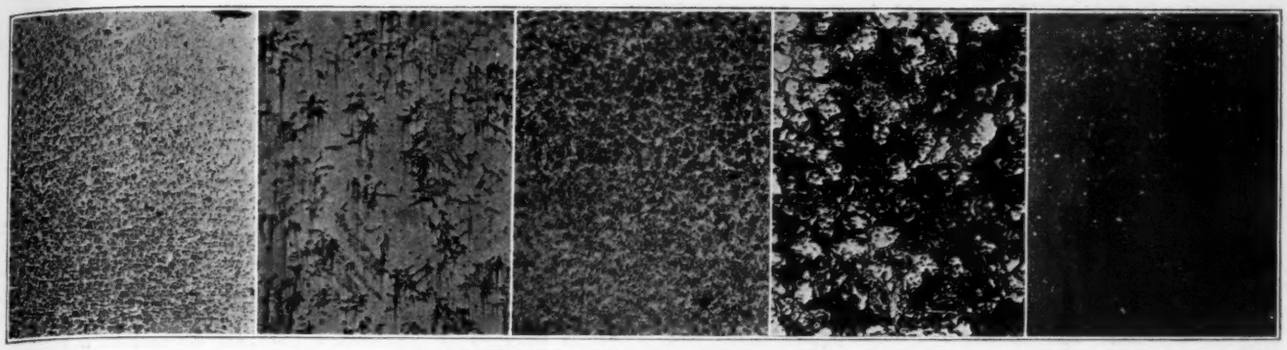
The flask with the mold then is fixed in the centrifugal casting machine, and after the introduction of the filtering feed runner the metal is poured while the machine is being rotated at the number of revolutions required for the particular size of pipe being made.

Pipe Removed While Hot

When the centrifugal casting is finished the flask is removed from the machine, and the pipe withdrawn from the flask. The pipe, which still is a cherry red, is allowed to cool slowly on the cooling platform, with some sand still adhering. The sand subsequently falls off when the pipe is cold, due to the layer of special blacking. The flask immediately is returned to the molding machine, and the cycle of operations is continued. 32,000 pounds per square inch of area.

Sand preparation methods exert an important influence upon the result obtainable by centrifugal casting. At Pesaro, an Italian sand is used which has excellent properties with regard to refractoriness, permeability, cohesiveness, etc. The chemical analysis of the sand is as follows: Moisture 9 per cent; loss due to burning 4.5 per cent; SiO_2, 72.20 per cent; Al_2O_3, 12.08 per cent; Fe_2O_3, 4.80 per cent; MgO, traces; CaO, 0.57 per cent; losses (unmeasured substances) 1.15 per cent.

An important feature of the method is the runner through which the metal is poured. This has been devised to supply metal almost instantaneously throughout the length of the mold. Pouring of the metal for a pipe 10 inches in diameter and 13 feet long, will require approximately 10 to 15 seconds, depending on the temperature of the molten metal. The feed runner also is designed to filter the metal, thereby retaining the major part of the slag which will be present even in a carefully cleaned ladle. Filtration of the metal gives a clean surface inside.



CENTRIFUGALLY CAST BY ARENZ PROCESS

Fig. 12—Carbon Distribution—Unetched—X 9. Fig. 13—Carbon Distribution—Unetched—X 90. Fig. 14—Ferritic Structure—Etched—X 9. Fig. 15—Ferritic Structure—Etched— X 90. Fig. 16—Absence of Phosphorus—Etched—X 9

Particular emphasis is given to the temperature and fluidity of the metal because it is upon these factors that the uniformity of the thickness throughout the length of the pipe will depend, even if the pipe is thin. It has been the intention to devise not only a runner capable of withstanding a large number of pouring operations, but also one from which all slag may be removed quickly after casting.

An important feature of the process is the saving in the initial cost of the plant. A project now under consideration comprises 12 centrifugal casting machines for the manufacture of exhaust and rain-water pipes, three molding machines with the necessary molding equipment, a number of flasks required for continuous production, patterns, equipment for the preparation of the sand, valves for all the automatic drives, etc., and the estimated expenditure is about $40,000. The plant will be capable of producing between 12 to 15 tons of centrifugally cast pipe in 8 hours.

Another feature of the process is that in addition to producing pipe of various diameters, it also is possible to make pipe of different lengths. After a few revolutions, the metal begins to assume a tubular shape under the influence of centrifugal force. Owing to the porous nature of the sand, any vapor formed between the metal and the internal surface of the mold permeates the layer of sand and condenses. The wall of the flask is provided with suitable outlets through which vapor may escape.

In the Italian process the machine is rotated at a greater speed than the permanent mold centrifugal casting, since the metal remains for a longer period in the physically pasty state during the green sand centrifugal casting process. The peripheral velocity has been determined in advance for every diameter made. Apart from this the peripheral velocity will vary with the thickness, even when pipes of equal diameters are produced.

Temperature Is Important

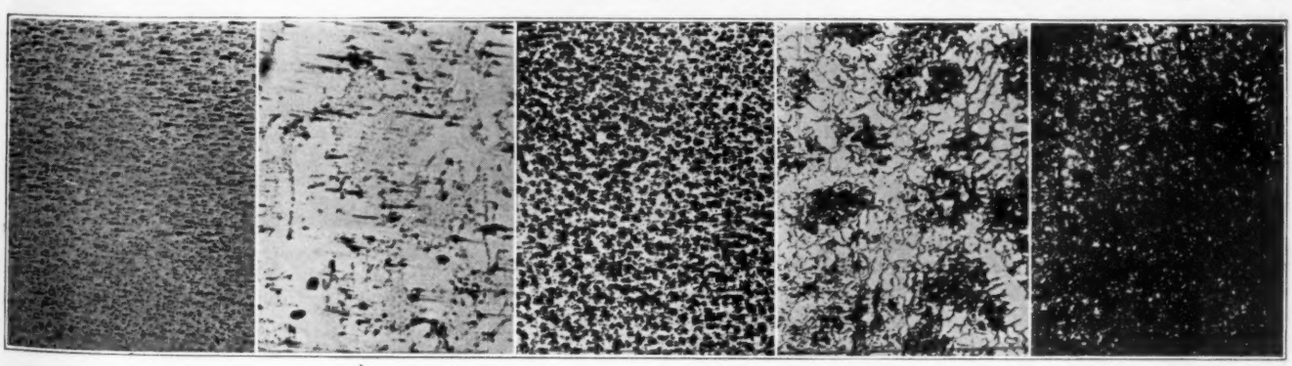
To insure perfect pipe, it is necessary to exert constant supervision over the temperature of the metal when it is being poured into the revolving mold. With the filtering runner, all impurities in suspension in the liquid, or formed in the ladle owing to the presence of the refractory lining, are reduced to a minimum, so that even the interior of the pipe is kept quite clean. Any small quantity of slag present is carried away by the rapidly flowing metal owing to the difference between its specific weight and that of the metal.

A pipe 0.118 inches thick under test has withstood a pressure equal to 368 pounds per square inch and another 0.278 inches thick has withstood a pressure of 735 pounds per square inch. The pipes tested had internal diameters of 5.9 and 9.8 inches and lengths of 6½ feet and 13 feet.

The problem of the casting pipe centrifugally in green sand requires a good mechanical training and a good knowledge of foundry work generally. Attention must be directed chiefly to the mixing of the various grades of iron, the mixing of the numerous classes of foundry sand and the calculation of the peripheral velocities, so that the centrifugal force applied shall not be such as to cause any deformation of the mold. In addition to these factors careful consideration must be given to the determination of the quantity of moisture required for the cohesiveness of the sand, which must not be excessive or such as to impair the efficiency of the centrifugal process.

Figs. 2 to 21 give comparative micrographs relating to the Possenti and Scorza method of green sand centrifugal casting; the normal method of pit casting; the Arenz method of permanent mold centrifugal casting (tempered pipe); and the De Lavaud method of permanent mold centrifugal casting (tempered pipe). These micrographs were obtained through the courtesy of Prof. Dr. Pisek, of the Czechoslovakian Polytechnic school, Brno, who has made a special study of the manufacture of cast iron pipes.

The micrographs shown in Figs. 2, 3, 4, 5 and 6 are those of pipes centrifugally cast by the Possenti and Scorza method which consists of high quality pearlitic cast iron. Fig. 2 shows



CENTRIFUGALLY CAST BY DE LAVAUD PROCESS

Fig. 17—Carbon Distribution—Unetched—X 9. Fig. 18—Carbon Distribution—Unetched— X 90. Fig. 19—Temper Carbon Accumulations—Etched—X 9. Fig. 20—Temper Carbon Accumulations—Etched—X 90. Fig. 21—Phosphide Distribution—Etched—X 9

the section of the pipe magnified 9 times, in which the regular distribution of the graphite, which has the appearance of fine small blades and rounded off particles, clearly is shown. The quantity and the size of the graphite particles increases from the outer and inner walls of the pipe toward the center.

The microscopic view shown in Fig. 3 magnified 90 times, was taken about the center of the thickness of the pipe. The same sample after being cleaned and etched with picric acid, Fig. 4, magnified 9 times, shows the normal pearlitic structure of gray pig iron. This structure is extremely fine, but in the internal part of the pipe it becomes modified, and the ferritic structure can be seen only to a slight depth.

Fig. 5 shows the internal portion of the pipe magnified 90 times, and in this white ferrite points and brown phosphorus points may be noticed on a matrix consisting of extremely fine pearlite. Micrograph 6, magnified 9 times, shows the distribution of the phosphorus. This test-piece was etched with nitric acid.

Graphite Is Coarser

Figs. 7 to 11 show micrographs of pipe made in the pit. Figs. 7 and 8, representing the thickness of the pipe magnified 9 and 90 times, respectively, show that the quantity and size of the graphite particles increased toward the central portion of the pipe, the structure of the graphite particles is much coarser than with the centrifugal sand cast pipes. The cleaned sample etched with picric acid, Fig. 9, magnified 9 times, shows a fine pearlitic structure. The same test-piece magnified 90 times, Fig. 10, shows that the white ferrite points are of the same size as in the sample made by the centrifugally sand cast method, on a pearlitic matrix. Fig. 11 is a micrograph of a test-piece etched with nitric acid, and in this can be noticed irregular distribution of the phosphorus, while in this case the white phosphorus points are rather larger than those observed in the sample made by the previous process.

Fig. 12 shows the distribution of the temper carbon throughout the thickness of the pipe in the Arenz centrifugal process, tempered pipe. This sample has been magnified 9 times. It will be noticed that this distribution is uniform in the center as well as throughout the inner and outer surfaces of the pipe. In the vicinity of the outer diameter, almost parallel with the surface, can be seen large nodules of temper carbon.

The central part of the thickness of the pipe, Fig. 13, shows that the distribution of the temper carbon is uniform, but that the size of the nodules is somewhat larger. This sample is magnified 90 times.

On examining the sample after etching with picric acid, as shown in Fig. 14, magnified 9 times, and Fig. 15, magnified 90 times, the ferritic structure may be observed. After etching the sample with nitric acid, Fig. 16, the almost total absence of phosphorus points is noticed which is only to be expected as during prolonged tempering phosphorus enters into solid solution with ferrite.

Chemical analysis of the Arenz tempered pipe gave the following results: Total carbon, 2.76 per cent; temper carbon, 2.30 per cent; combined carbon, 0.46 per cent; silicon, 2.40 per cent; manganese, 0.60 per cent; phosphorus, 0.69 per cent; sulphur, 0.12 per cent.

Micrographs 17 to 21 relate to the De Lavaud process with tempered pipe. Fig. 17, magnified 9 times, showing the thickness of the pipe, and Fig. 18, magnified 90 times, showing the central portion of the thickness, demonstrate that temper carbon is uniformly distributed throughout.

After etching the sample with picric acid, Fig. 19, magnified 9 times, and Fig. 20, magnified 90 times, it is shown that the temper carbon accumulations are in a ferritic matrix, with an admixture of ferrite and sorbite.

When the test-piece has been etched with nitric acid, it is seen that the distribution of the phosphorus, Fig. 21, is not uniform, and in the vicinity of the internal diameter it is more plentiful than at the outer.

These experiments show that the Italian process possesses the advantages of centrifugal casting, namely good distribution of the graphite and of the phosphorus in the form of fine grains, a pearlitic instead of a ferritic structure, apart from the thin film found about the inner diameter of the pipe, which is of no great importance since this ferritic formation may be removed easily by more rapid cooling.

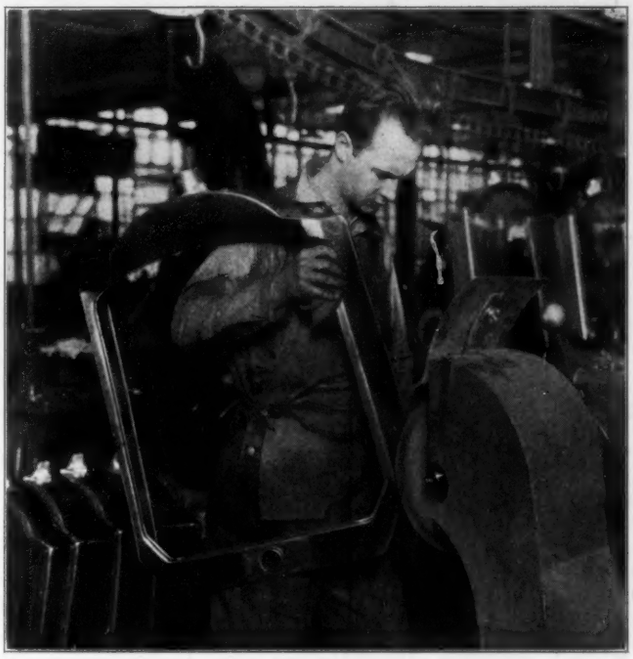
Centrifugal casting in green sand molds has given the following results: Cast iron having a pearlitic matrix and great tensile strength; uniformity in the various thicknesses; reduction of weight as compared with vertically cast pipes; rapidity of production; employment of a moderate amount of capital for the acquisition of the necessary plant; low production costs; rejections reduced to a minimum; minimum quantity of slag inside the pipe, owing to the use of a filtering feed runner and fluid metal and elimination of pipe tempering plant.

Production of fuel briquets in the United States in 1927 was 970,468 net tons.

Truck Cranes Erect Huge Steel Girder

AN INTERESTING operation with two truck cranes attracted attention recently in Atlanta, Ga. The two cranes were used to swing into position a 60-inch steel girder, weighing 13 tons, in the construction of a new union depot. They worked simultaneously and handled the girder in a difficult position as readily as would much larger stationary equipment. The cranes were built by the Universal Crane Co., Elyria, O.

Polishing and Plating Room Layout Avoids Backtracking



Polishing a steel radiator shell preparatory to nickel plating

A GENERATION ago the average manufacturer looked upon polishing and plating as necessary evils connected with production operations and at that time the typical department devoted to these operations was housed in any convenient out of way place such as a basement. Little attention was paid to efficiency as rule-of-thumb methods were common. Routing of work so it would pass through the department as rapidly as possible was unheard of.

The art of polishing and plating, however, is being gradually reduced to an exact science and the hit-or-miss methods of yesterday have given place to up-to-date procedure that has proved economical through scientific tests. In the typical present-day polishing and plating department it will be found that much attention has been given to the problem from a production angle so that the work passes through the various processes with as little delay and backtracking as possible.

The object of this article is briefly to describe some of the methods followed at the recently equipped new plating and polishing department of the Packard Motor Car Co., Detroit, which enjoys the distinction of being one of the most modern installations of its kind on the American continent. The department is housed in a light, airy room on the second floor of one of the Packard manufacturing buildings. It is 400 feet long and 10 feet wide, occupying a floor space of 40,000 square feet, or very nearly one acre, with the polishing, nickle-plating, and buffing departments located one after another in the order named.

The polishing department is equipped with 52 Gardner motor-driven lathes, while 25 Gardner buffing lathes are in operation in the buffing department. Each unit is electrically driven and the department is fitted with a modern system for carrying away the lint and abrasive dust that generally is present in the average polishing room. The exhausting system works effectively so that the department is no more untidy than the average condition in any part of a modern manufacturing plant.

While a great variety of parts are handled in the department, the operations followed in polishing, plating and buffing radiator shells are of more than usual interest. Great pains are taken in this work for due to the conspicuous place it occupies, a radiator shell should be finished with unusual care.

Packard radiator shells are sheet steel, formed under massive drawing dies. The first operation in the polishing department consists of putting the parts twice over canvas wheels, 14 inches in diameter 3½-inch face, set up with No. 70 manufactured alumina. Next follows two polishing with wheels set up with No. 120 alumina while the last two operations are with No. 150 grain. The parts are inspected carefully and then are ready for plating.

As the accompanying illustration shows, the department is fitted with an overhead conveying system which carries the work. At one end of the system is the plating department where the work is unloaded and located on another conveyor which carries the parts through the plating operations.

Plating is performed in an automatic machine designed especially for this work. In the plating department the operations performed automatically are as follows:

1—Electric clean with alkaline solution
2—Water rinse
3—Hydrochloric acid dip
4—Cold water rinse
5—Cyanide dip
6—Cold rinse
7—Brush with pumice
8—Cold water rinse
9—Copper plate
10—Cold water rinse
11—Hot water rinse
12—Buff
13—Electric clean with akaline solution
14—Cold water rinse
15—Hydrochloric acid dip
16—Cold water rinse
17—Cyanide dip
18—Cold water rinse
19—Brush with pumice
20—Rinse in water jets
21—Nickle plate
22—Cold rinse
23—Hot rinse

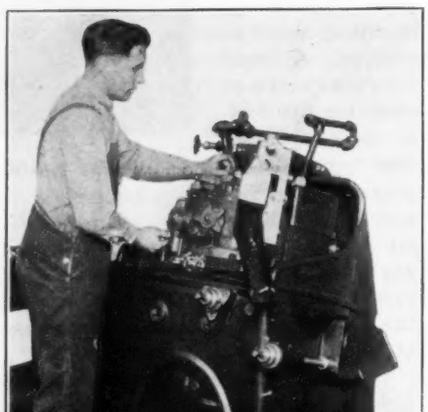
The radiator shells then go to the buffing department where they are buffed on muslin wheels, 16 inches in diameter, 3-inch face. The

(*Concluded on Page* 1000)

Production Speeded by New Offset Miller

No. 260

Oesterlein Machine Co., Colerain and Monmouth streets, Cincinnati, has designed a new 28-inch tilted offset milling machine incorporating the same general principles of offset milling as are used in the 48-inch machine made by this manufacturer. Relatively large cutters, the two centers of which are offset from each other to obtain the proper depth of cut, form the basis around which the design of this machine has been developed. Cutting is continuous, there being no return to starting point. The device is intended for use in milling operations on screws and bolts such as flatting the heads of connecting rod bolts and slotting screws. Because the production on such work by the offset process is said to be limited only by the number of parts the operator can handle, means are provided in the work holding fixtures for automatically clamping, unclamping and ejecting the parts, as shown in the accompanying illustration, thus leaving the operator's time for loading. Provision is made for the use of 20 gallons of coolant per minute on the machine. A large chip basin is located within the base. Heat treated, multiple, splined gears are used throughout. Table diameter is 18 inches; the drive is furnished by a 3 horsepower motor operating at 1800 revolutions per minute and connected by a chain to the driving sprocket.



No. 260—Tilted offset miller

Heavy-Duty Arc Welder Uses Direct Current

No. 261

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently has developed a 300-ampere direct current arc welder, designed for heavy duty work and continuous service in shops and in the field where direct current only is available for the driving mo-

Iron Trade Review's Calendar of New Equipment

No.	Item	Builder	Comment	Date Described
238.	Electric motor	General Electric Co.	Single phase repulsion induction type	Sept. 20
239.	Molding machines	Osborn Mfg. Co.	Portable types for medium size molds	Sept. 20
240.	Semisteel pulley	W. A. Jones Foundry & Machine Co.	High wearing qualities; suited for jerky load	Sept. 20
241.	Open-side planer	Cleveland Planer Co.	48-inch type designed to do work of 60-inch machines	Sept. 20
242.	Acetylene generator	Oxweld Acetylene Co.	Three sizes; 50, 100 and 300-pound carbide capacities	Sept. 20
243.	Cutting torch	Air Reduction Sales Co.	Improved high-pressure valve construction	Sept. 27
244.	Arc welder	Lincoln Electric Co.	Tractor-type; for lap or butt welding	Sept. 27
245.	Slip roll former	Niagara Machine & Tool Works	Will handle 22-gage metal	Sept. 27
246.	Coupling	T. L. Smith Co.	Full-floating flexible type for driveshafts	Sept. 27
247.	Truing fixture	Gleason Works	For truing circular cutters	Oct. 4
248.	Shaper	Cincinnati Shaper Co.	Wide range of speeds and cross feeds	Oct. 4
249.	Center lathe	Bullard Machine Tool Co.	Independent spindle and tools speeds at each station	Oct. 4
250.	Grinding wheel	Blanchard Machine Co.	Six abrasive segments clamped into chuck	Oct. 4
251.	Riveter	Chicago Pneumatic Tool Co.	Squeezes instead of hammers rivets into place	Oct. 4
252.	Electric drills	United States Electrical Tool Co.	Portable, high speed, ¼-inch type	Oct. 4
253.	Draw-cut shaper	Morton Mfg. Co.	High duty type; 32-inch stroke	Oct. 4
254.	Shape cutter	Linde Air Products Co.	Cuts with oxyacetylene blowpipe; automatic operation	Oct. 4
255.	Assembly press	Hanna Engineering Works	For use in chassis frame riveting installations	Oct. 4
256.	Drill	Ingersoll-Rand Co.	Operated by air motor; for close quarter work	Oct. 11
257.	Cutting material	Sullivan Machinery Co.	Substitute for diamond in diamond core drill bits	Oct. 11
258.	Boring tool	Schmidgall Mfg. Co.	Drills variety of holes in wide range of materials	Oct. 11
259.	Compound crane	Modern Pouring Device Co.	For double crane service on wide crane bay	Oct. 11
260.	Offset miller	Oesterlein Machine Co.	For use in milling operations on screws and bolts	Oct. 18
261.	Arc welder	Westinghouse Electric & Mfg. Co.	For heavy-duty work; operates from direct current	Oct. 18
262.	Trimming press	Chambersburg Engineering Co.	Forged steel side frames; other safety features	Oct. 18

tor. The driving motor and generator are enclosed in the same frame, while the control is mounted on top, being in a part of the frame and protected by a sheet steel cabinet. A common shaft with a ball bearing at each end is used for the generator and driving motor. The motor is compound wound and of the constant-speed type, designed so that it can be used on either a 230-volt or 550-volt line. A starting rheostat, mounted in the control cabinet, is claimed to provide low voltage protection. The generator is differentially compound wound and is separately excited from the motor supply. The welding range is from 75 to 400 amperes. The desired welding current can be obtained by the proper adjustment of the one-dial rheostat provided for this purpose. The rating of the welder is 300 amperes, 1 hour, 50 degree Cent. rise on a resistance load at 25 volts.

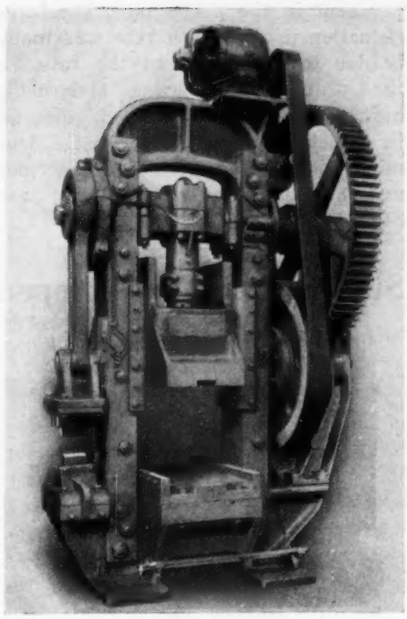
Designs Trimming Press for Safe Operation

No. 262

Chambersburg Engineering Co., Chambersburg, Pa., recently has placed on the market a trimming press with forged steel side frames. Safe and continuous operation and freedom from side frame breakage were aimed at by the incorporation in the press of the heavy side frame forgings, as shown in the accompanying illustration, semisteel bed frame and yoke, oversized crank, outboard bearings on all shafts and friction-slip flywheel. The new design of the flywheel is said to eliminate the danger of the flywheel bursting or the crank or gears being broken when an overload stalls the press. The energy developed by a sudden stop of the machine, instead of expending itself as a strain on all moving parts, is released by the flywheel slipping on its hub against friction. Other new features of the press are the installation of roller bearings on auxiliary shafts; high-pressure grease lubrication to all bearings and surfaces; a pitman adjustment that grips thread for thread the length of the screw; and improved clutch operation. The press is supplied in either single or double crank construction.

Cement Output Expands

In September the Portland cement industry produced 17,856,000 barrels, shipped 20,462,000 barrels and had in stock at the end of the month 16,722,000 barrels, according to the United States bureau of mines. Compared with September, 1927, production was up 2 per cent and shipments up 3.2 per cent. In the nine months ended with September production amounted to 131,036,000 barrels, compared with 128,286,000 barrels in the similar period of 1927.



No. 262—Trimming press

Grace Tells Employes How To Help Themselves

American industry faces no more important task today than to protect the buying power represented by wages, according to E. G. Grace, president of Bethlehem Steel Corp., in a letter on "Prosperity and High Wages" published in the *Bethlehem Review*, a news bulletin which goes to Bethlehem employes. Mr. Grace points out that every year through conferences with employes' representatives Bethlehem makes a report to employes on matters of joint interest just as it reports to the stockholders at annual meetings. The conferences this year discussed the necessity of maintaining the wage levels upon which American standards of living are based. Mr. Grace says:

"In the last ten years a new order has been created in our economic life. It is recognized first, that high standards of living are based on the greater earning power of labor and second, that continued prosperity and high wages go hand in hand.

"Progressive industrial management seeks to enable employes to earn wages as high as can be paid. Even when profits decline or business falls off efforts are made to economize in other ways than by cutting wages. But management alone is powerless to maintain high wages. They can be paid only so long as economic conditions will permit them to be paid.

"One of the chief factors affecting this ability to pay them is foreign competition. With European wages far below American wages and consequently costs of production lower abroad, European manufacturers can compete on equal terms with the products of higher paid American labor.

"As a citizen the employe's responsibility is to take an active, intelligent interest in company and public affairs. We have reached a point in this country today where thousands of employes are also stockholders with both a pay roll and company interest in continued prosperity.

"Certain it is, therefore, that as wage earners, stockholders and citizens our outstanding interest is an economic one. If we are mindful of that fact and act accordingly we shall co-operate with each other to promote our company's prosperity and see to it that nothing is done to disturb American living standards which have taken us so many years of hard work to establish."

Implement Exports High

Exports of agricultural implements from the United States in August again exceeded $13,000,000, making the total for the first eight months of 1928 reach a new high level of $81,686,133, according to the agricultural implements division, department of commerce.

The volume of shipments thus far this year is greater than shipments in any of the boom years immediately following the war and exceeds exports in 1920, which was a peak year. The exports during the first eight months of this year have also exceeded those of any full calendar year since 1920, with the exception of 1926 and 1927.

Hold Oil Exposition

International Petroleum Exposition at Tulsa, Okla., Oct. 20-29, will feature a display of oil field equipment, tools and machinery valued at more than $10,000,000. There will be approximately 300 exhibitors, including leading manufacturers of oil field equipment throughout the world. W. G. Skelly, president of Skelly Oil Co., heads the exposition, and J. Burr Gibbons is general manager.

Meeting Is Postponed

The welding conference, which was to have been held at Purdue university, Lafayette, Ind., Dec. 5 to 7, 1928, has been postponed until Dec. 12 to 14.

Layout of Polishing Room Avoids Backtracking

(*Concluded from Page* 997)

machines are the same type used in the polishing room, while the abrasive medium is tripoli which is applied to the wheels in cake form as required.

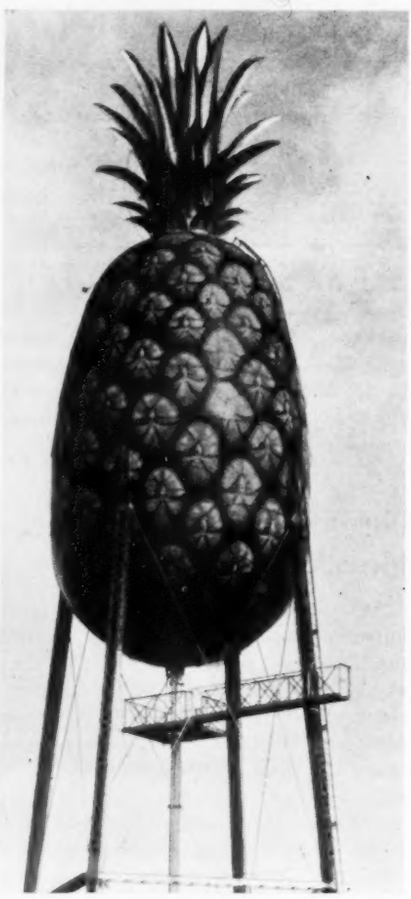
Great pains are taken in setting up the polishing wheels for if this is not done properly the abrasive expense is abnormal. The glue is heated properly to the correct temperature and only enough glue to last a few hours is made up for glue that is permitted to remain in a heated state for any length of time loses its strength. The setting up process in itself is simple as it consists of coating the wheels with glue and rolling them in a trough of abrasive. In some cases one coat is all that is necessary and again two or more coats may be required. This depends on the condition of the wheel and the work it has to do. The majority of the wheels used at the Packard plant are stitched canvas. They are procured in sections and made into wheels for various purposes by a special process.

Care is exercised to make sure that all polishing wheels are in balance. If a wheel is unbalanced it pounds, wastes abrasive, and does not produce efficient work. The wheels are balanced on an appliance of approved design fitted with ball bearing rollers on which an arbor carrying the wheel is set. The device is very sensitive and the heavy side of the wheel invariably comes to rest at the bottom. Balancing is performed by nailing a little piece of lead on the light side of the wheel to compensate for the heavy section. Polishers become expert at balancing the wheels so that one can be corrected and tested in a very short time.

Accident Rates at Metal Mines Reduced

Metal mining in the United States had fewer deaths and injuries from accidents to its employes in 1927 than in 1926, according to a study of reports from operating companies just completed by the United States bureau of mines. The death rate was reduced from 3.47 per thousand 300-day employes in 1926 to 3.10 per thousand in 1927 and the nonfatal injury rate was reduced from 245 to 222 per thousand employes. The iron mining industry effected a reduction of 14 per cent in the injury rate and 42 per cent in the death rate; the large reduction in the death rate was mainly due to the fact that the rate for the previous year was abnormally high on account of a single disaster in which 51 lives were lost. Iron mines in 1927 reported 33,386 men and 8,921,001 shifts, 73 killed and 3409 injured.

Steel Water Tank Shaped Like Pineapple



THE largest pineapple in the world greets the Hawaiian visitor's eye as his boat approaches the dock at Honolulu. It is mounted atop the Hawaiian Pineapple Co.'s four-story office and warehouse building, in plain sight from the famous Waikiki beach. The pineapple is in reality an elevated water tank. It has a capacity of 100,000 gallons of water, which supplies an automatic sprinkler system. The entire structure is built of steel. Even the leaves are cut from steel plates, shaped and riveted in a cluster. The tank was fabricated in the Greenville, Pa., plant of the Chicago Bridge & Iron Works, and erected by this company.

The rubber industry consumes more than half the carbon black produced in this country from natural gas.

Rules on Spathic Ore

There has been variance in the classification of spathic iron ore at the ports of New York and Cincinnati. In the future it is to be assessed at 30 per cent under a ruling of Frank Dow, acting commissioner of customs. Writing to the New York collector on this subject Mr. Dow says:

"It appears from the report that two importations of so-called spathic iron ore have been received at your port and that they have been assessed with duty at the rates of 30 per cent ad valorem under paragraph 214 of the tariff act. In support of his advisory classification the appraiser states that the merchandise has been chemically treated and its value enhanced to about ten times the value of ordinary ore; that it is not handled in the trade as iron ore, and that it is not used for smelting.

"In view of these statements the bureau concurs in your opinion that the merchandise is properly excluded from the provision for iron ore in paragraph 1597 of the tariff act and that it should be assessed with duty at the rate of 30 per cent under paragraph 214 of the said act."

Consider Electric Heat

Engineering extension department of Pennsylvania State college will hold its second conference on industrial electric heating at State College, Pa., Oct. 24-27. A series of meetings for practical men will be devoted to consideration of the uses of electric heating in the ferrous and nonferrous industries. Specialists will lead discussions on new developments in electric melting of gray iron, brass, manganese, alloy steels; on annealing, carburizing, heat treatment, and various types of furnaces. Many of the talks will be illustrated.

To Enlarge Tube Plant

Michigan Steel Tube Products Co., Detroit, announces extensions and improvements to its plant which will cost $300,000. The plans include additions to the manufacturing buildings, steel storage building and a new office building. Christian W. Brandt, Detroit, is architect. The company will have a capacity, when these improvements are completed, of 5,500,000 feet of tubing monthly. The tubing is electrically welded and is sold for diversified purposes.

Mine production of silver in Arizona in 1927 was 234,010.97 fine ounces.

Editorials

Philadelphia Metal Week Successful

ANOTHER National Metal Week has come and gone and with its passing another scientific and industrial achievement is recorded upon the pages of modern progress. Meeting in Philadelphia last week in simultaneous conventions, the American Society for Steel Treating, the American Welding society and Institute of Metals attracted attention from the metalworking industries not only from America but from abroad as well.

Metallurgists and metal fabricators play major roles in providing for the needs of mankind. Our transportation systems, including travel on land, sea and air, are but one example of what has been accomplished through the study, development and treatment of metals and their alloys. As time passes, it might be supposed that the fields of discovery are narrowing and that our greatest strides already have been made.

A review of the activities of last week, however, indicates that perhaps our greatest achievements lie ahead. New cutting materials are being developed, improved heat treatments are providing superior physical properties in tool steels and structural materials and new methods of joining metals together are effecting substantial economies. A visitor at any session conducted in Philadelphia last week could not but wonder as to what startling developments will result from research during the next 12 months.

Perhaps a more tangible evidence of progress was to be gained from the National Metal Exposition where the latest furnaces, metallurgical equipment, testing apparatus, steels and alloys, welding machinery and welded products were displayed for inspection. That industry appreciates the importance of keeping abreast of progress was indicated by the fact that before the exposition had closed much of the equipment was tagged as "sold." The 1928 National Metal week must be pronounced unusually successful.

Records Speed Equipment Needs

FOR manufacturers of equipment the production records being registered this year augur well. The new height of raw steel output has subjected the iron and steel plant of the United States to operating stresses exceeding any previous rush period. The trend of prices in the last half year has been upward and 1928 will, on the whole, be more remunerative than 1927 and some previous years. No small portion of this record tonnage has been taken at a price which has disadvantaged the high-cost producer. Hence it appears logical that both the need and the will and the means for replacements and betterments in 1929 are greatly improved.

In consumptive outlets the same forces are at work. The record steel output has been passing directly into finished materials and the metalworking plant of the country, like the production plant, has been subjected to the same intensive use, though of a more spotted character. There are so many hours of service in any commodity, be it firebrick or a conveyor belt, and the gait of 1928 has been fast. This is the day of mechanization; it is desirable in flush times and imperative in lean ones. And steel is the sinew of mechanization.

Competitors Who Co-operate

ACTUAL demonstration of the benefits derived from intelligent co-operation in technical research was afforded visitors at the National Metal exposition at Philadelphia last week by the exhibit of the Electric Steel Founders' Research group. The castings displayed in this booth were representative of the best the industry can produce and fairly indicated the influence of co-operative research on the quality of castings turned out by the five companies comprising the group.

It is noteworthy that this organization, founded in 1920 under the direction of Maj. R. A. Bull, is one of the few that have clung religiously to a definite program and have gone far toward achieving success in carrying out the avowed purposes for which they were organized. The electric steel founders confine their collective activities to technical research; in every other sense they are competitors. Hence the title of the booklet they now are distributing, "Competitors Who Have Co-operated to Improve Quality," not only describes their mission accurately, but also reflects credit on their work.

Farm Mechanization Only Begun

LEADERS of the farm implement industry, at the recent convention of the National Association of Farm Equipment Manufacturers in Minneapolis, expressed utmost assurance of

the broad field in further development of farm machinery that lies ahead of the industry. This was one of the noteworthy sentiments in regard to the future outlook. Needs in mechanical accomplishment that thus far have defied practical solution in farm problems eventually may result in new and perhaps revolutionary types of farm equipment. Many manual tasks finally may yield to mechanical contrivances, just as the cultivation of corn, formerly one of the slowest and hardest jobs in hand farming, eventually yielded to machinery, one speaker pointed out. Farm equipment engineers are constantly at work on the design and adaptation of machinery for further saving of labor and costs on the farms.

Hard, practical farm problems are forcing farmers to turn their attention more closely to reduction of costs. In this phase of farm relief the relationship of the implement manufacturer and the farmer is of great importance. Diversified farming also will require a wider variety of farm equipment. One survey recently estimated that something more than $1,500,000,000 of farm equipment is required to bring farming to a modern, efficient basis, without taking into consideration such factors as the heavy volume of outdated, obsolete and worn-out machinery now on farms. The farm implement industry, both directly and indirectly, is an important consumer of many lines of iron and steel. The industry's continued prosperity should bestow broad benefits.

Incentive Plans Succeed in Steel

IF A "blanket" wage rate is not adopted, and employes are to be paid according to individual merit, the method of compensating them must be made as fair as possible. In small organizations the problem of arriving at a basis of value and grading employes accordingly is not so difficult as in those industries employing thousands of men. Incentive plans have been used successfully many years in manufacturing plants. In eight of the leading industrial states the proportion of workers on piecework and bonus systems ranges from 38.6 per cent to 70.9 per cent. Michigan having the largest number of automobile factory employes likewise has the maximum percentage of employes on incentive plans. And, incidentally, the weekly earnings of employes in the entire automobile industry, where piecework and bonus systems are predominant, are the largest of any industry in the United States.

Incentive plans on a broad scale are comparatively new in the steel industry. Therefore, the experiences of the Bethlehem Steel Corp., almost half of whose employes now are paid under such a system, are interesting. The Bethlehem corporation has expended over $150,000,000 in the past five years in modernizing plants and installing new machinery, and this has improved the productiveness of its employes. But making due allowances for this, the corporation notes some of the results of incentive wage plans as follows:

In relining open-hearth steel ladles costs were decreased 14.4 per cent while average earnings of employes increased 21.3 per cent.

On track repair work costs were decreased 34 per cent while average earnings of employes increased 25 per cent.

In making repairs to soaking pits costs were decreased 20.4 per cent, while average earnings of employes gained 19 per cent.

Average yearly wages increased 119.1 per cent from 1913 to 1927, while production of finished steel per man increased 34.5 per cent.

These figures suggest the usefulness of incentive plans, especially where employes have a part in their discussion, with relation to the company's business.

Europe Fears Our Steel Exports

EUROPEAN iron and steel interests are looking toward the United States as a strong potential competitor in world markets. *Metallurgie*, a French publication devoted to this branch of industry, expresses a feeling that formation of the American Export association is a direct menace to the European steel cartel.

Observers in Europe believe output in America is increasing more rapidly than domestic consumption can be expected to increase and that, therefore, America will be forced to pay greater attention to export trade. *L'Usine*, another French publication, asserts that prospects for increased American competition in world markets render it imperative for European producers to co-operate if they are not to be seriously handicapped in export markets.

Apparently the former attitude of European steelmakers is undergoing a decided change. Formerly they were secure in their belief they could undersell on the world market, and usually did. It was believed then that superior skill in serving outside markets was at bottom of this ability to place their products in competition with American goods. Now, however, under the belief that pressure to sell an American surplus in export, Europeans seem to feel they are not as secure as they formerly felt themselves.

The steel cartel is generally regarded as valuable for the industrial co-operation it has brought about in Europe and it is relied on to aid greatly in the expected struggle to retain hold of export markets.

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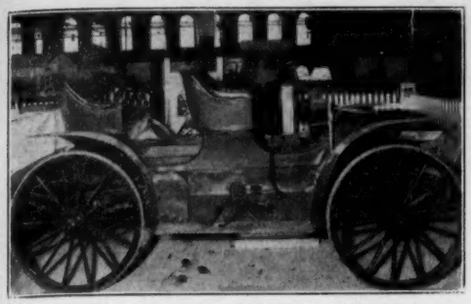

Interesting Details of National Metal Week. Beginning on Page 975.

THIS issue of IRON TRADE REVIEW features the technical papers and discussions at the convention of the American Society for Steel Treating, the meetings of the American Welding society and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, in Philadelphia, last week. The issue of Oct. 11 fully described the National Metal Exposition, while now complete details are given respecting the transactions by these organizations. Space also is given in the present issue to three other conventions.

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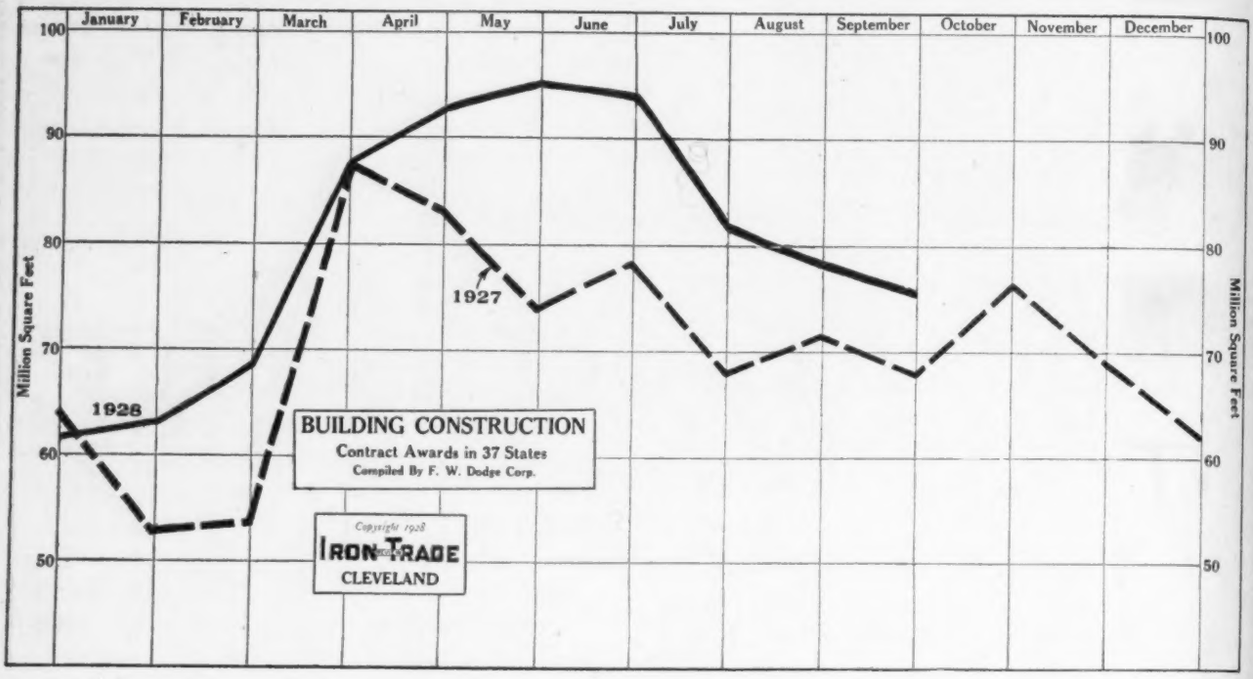
The Business Trend



Industrial Construction Expanding

By JOHN W. HILL, Financial Editor

TWO facts are outstanding in the building construction situation. One is the continuance of large scale activities, in the face of adverse credit conditions. The other is the important increase in industrial building. During September building contract awards in 37 states, as measured by the F. W. Dodge Corp., was 75,795,000 square feet.

THIS compared with 78,873,000 square feet in August and with 67,740,000 square feet in September, 1927. The decline in September compared with August was not significant of any retarding effect of higher rates for time money. The recession amounted approximately to 3 per cent. One year ago, when money was abnormally easy, there was a falling off of 7 per cent from August to September.

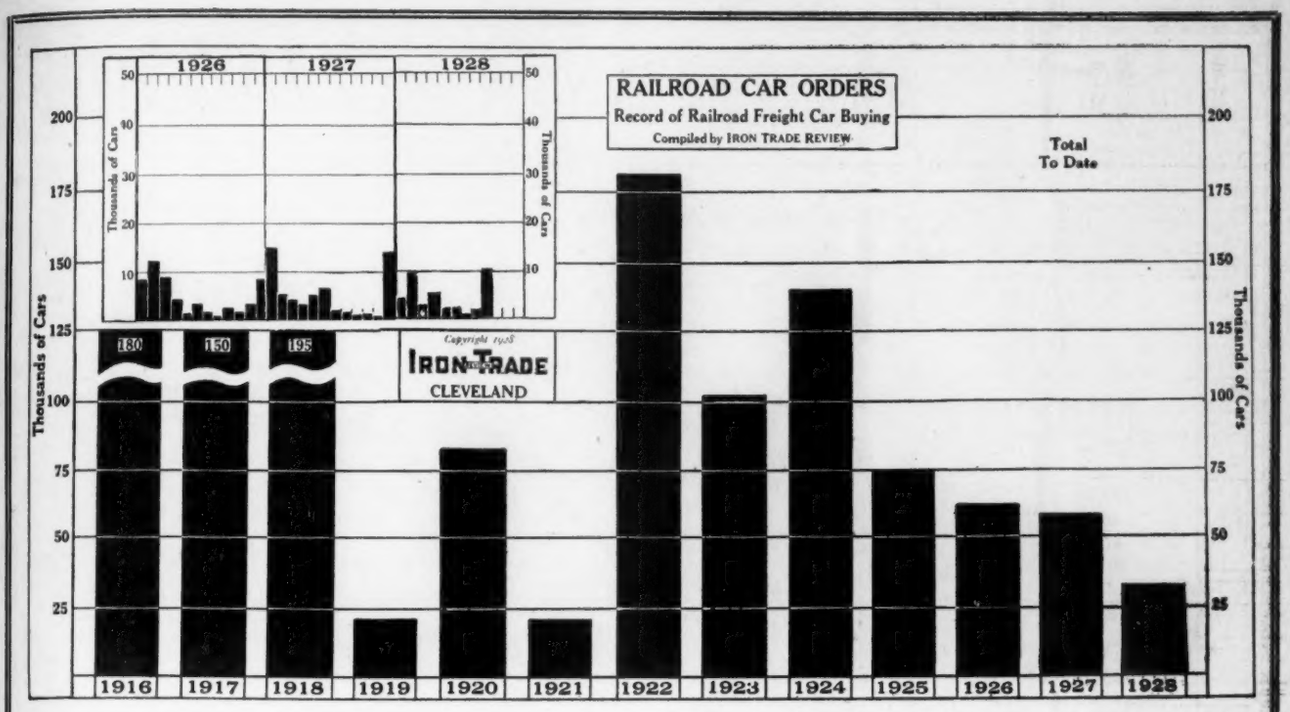
UNQUESTIONABLY, an extended period of tight money might be expected to have some effect upon building eventually. But two offsetting factors are at work now. In the first place, the peak of money rates apparently has passed. In the second industrial enterprises have shown their ability to raise needed funds through common stock issues.

LAST month industrial contract awards amounted to 10,579,500 square feet compared with 8,748,400 square feet in August and 5,615,000 square feet in September, 1927. Residential building, on the other hand has tended to decline, reflecting less speculative building and also the fact that housing shortages that once existed have been made up.

ANOTHER evidence of great industrial expansion is found in the record of machine tool orders. The National Machine Tool Builders association index now stands at very near the peak for all time, which was early in 1920. In factories as well as on the farms, never in history has there been such a tremendous movement toward mechanization as now. This would seem to herald a great continued period of industrial activity and efficiency.

AN IMPORTANT development has been the expansion on railroad buying. Car awards in September were greater than in August or in September, 1927. It seems probable that they will continue to increase, because all signs point to rising car loadings compared with one year ago, over the last months of the year.

The Business Trend

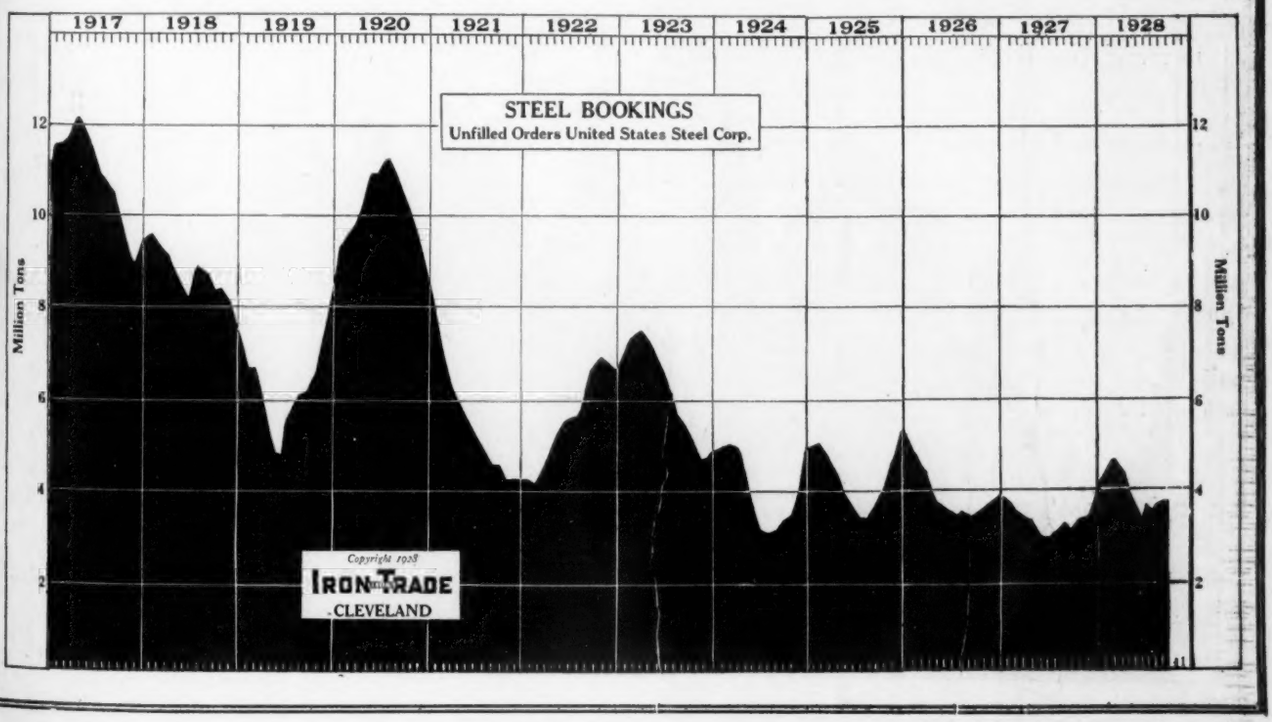


Railroad Car Orders

HEALTHY improvement in the buying of cars by railroads appeared last month with the placing of approximately 1406 freight car orders. This compares with 667 awards for cars in August, and 682 in September, 1927. For the first nine months of the year, the railroads of the country have purchased 30,999 freight cars compared with 46,323 in the corresponding period of one year ago. Present indications are that further gains in car buying will continue with the predicted increase for freight traffic.

Steel Bookings

UNFILLED orders of the United States Steel Corp. showed an increase of 74,325 tons during September. This increase compared with one of 53,116 tons in August and with a decline of 48,000 tons in September, 1927. The large gain in orders during September was all the more notable in view of the high rate of operations prevailing in steel mills during the month. Orders on the books of the corporation at the close of September amounted to 3,698,368 tons compared with 3,148,113 tons one year before.



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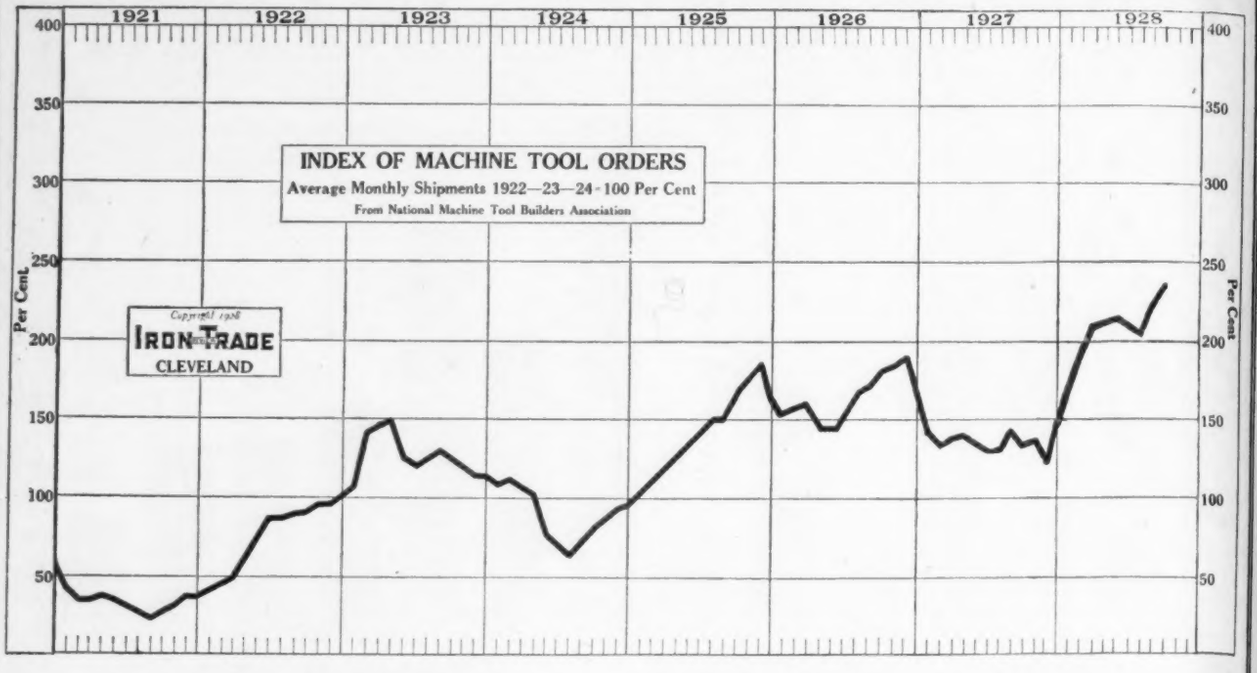
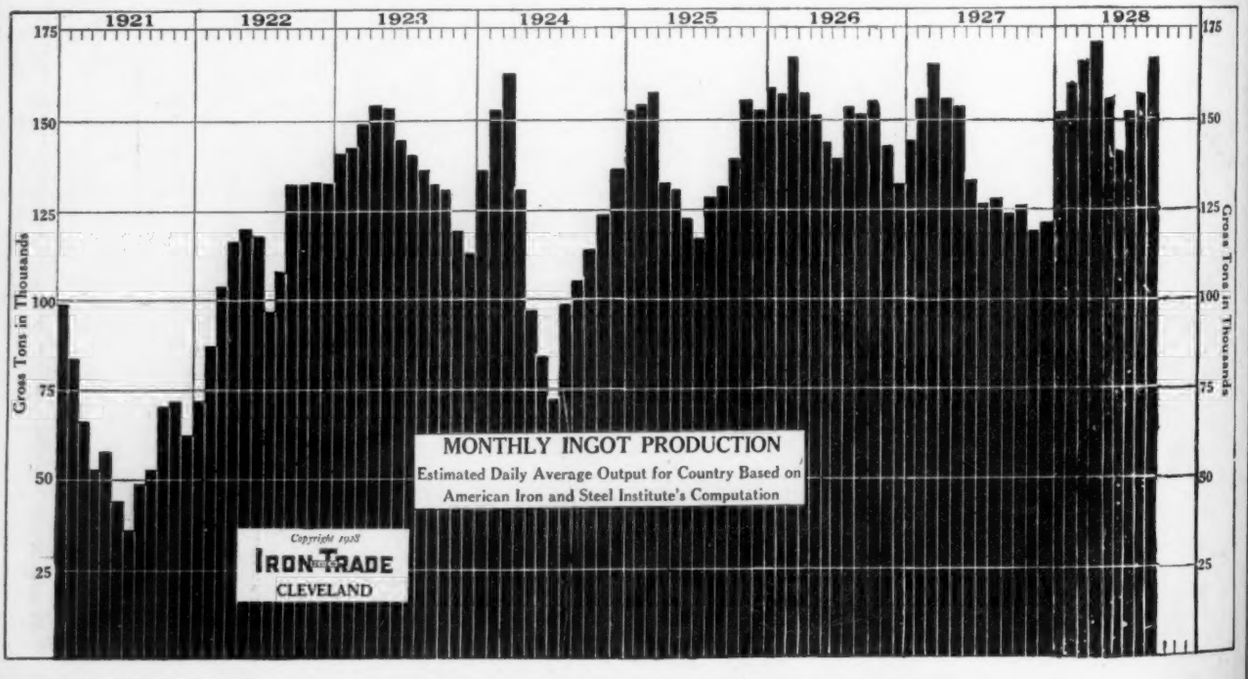


Machine Tool Index

ORDERS for machine tools continue on a large scale. The three months moving average computed by the National Machine Tool Builders' association covering July, August and September stood at 236.8 compared with 219.9 for the three months of June, July and August and with 135 for the corresponding period of 1927. Machine tool buying at the present time is running at the highest rate of any period since the boom months of 1920. The high rate reflects the large increase in activities in industrial plants.

Monthly Ingot Production

STEEL mill activity established a new high record for the month in September. The output of ingots made a daily average of 165,903 tons compared with 154,759 tons in August and 125,726 tons in September, 1927. Aggregate output for the first nine months of the year was 36,930,520 tons compared with 33,778,953 tons for the corresponding period of 1927. During September operations of steel mills were on the basis of 88 per cent of capacity against 68 per cent one year ago.



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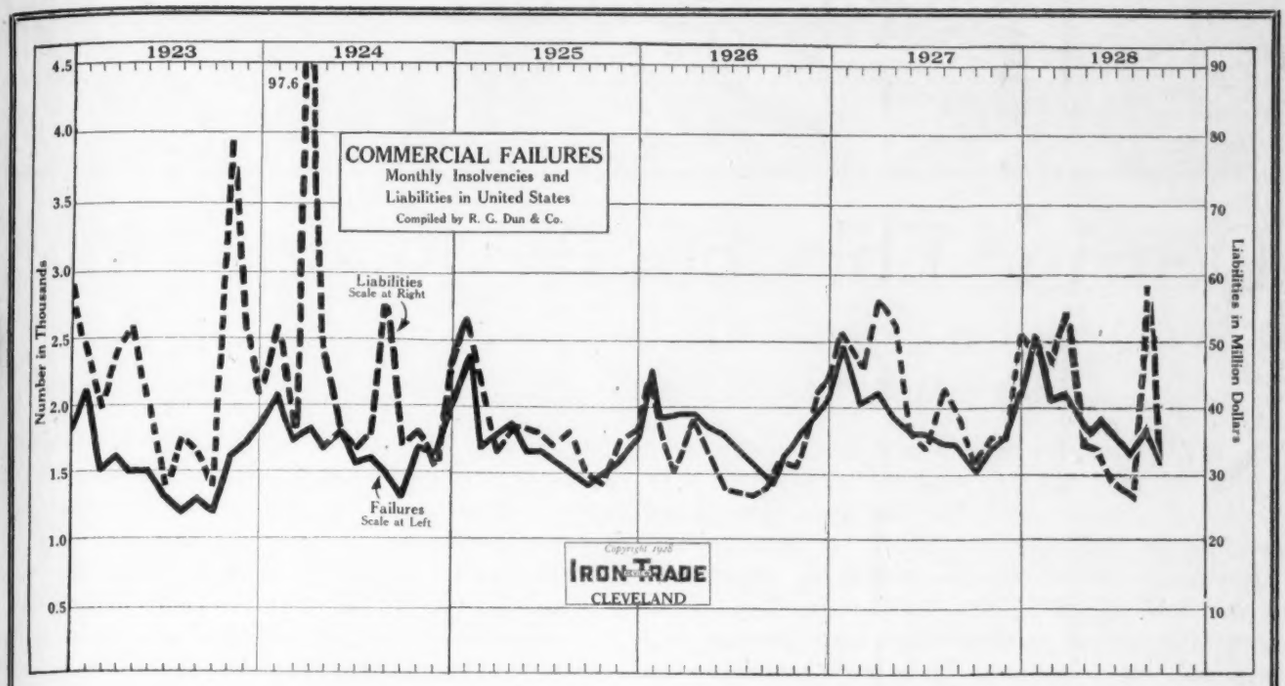
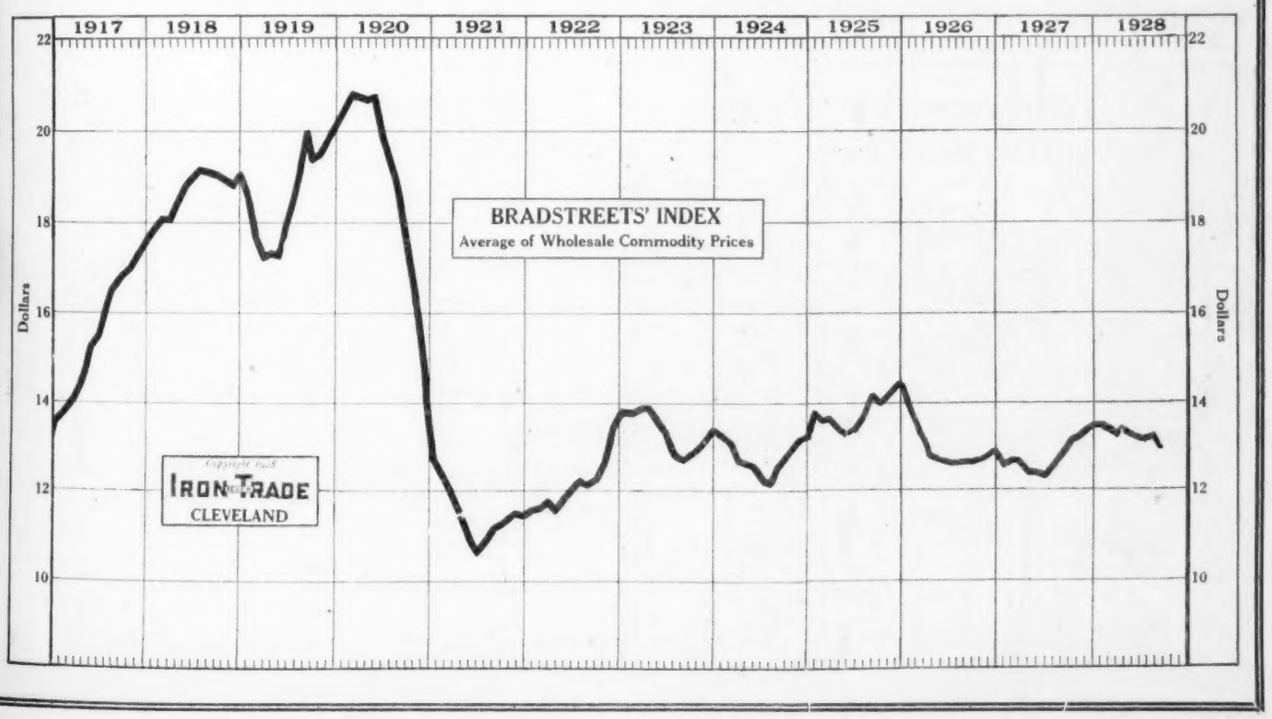


Commercial Failures

DURING September the number of commercial failures in the United States as reported by R. G. Dun & Co. was 1635 compared with 1852 in August and 1573 in September, 1927. Liabilities were $33,956,-686 compared with $58,201,830 in August and $32,786,125 in September one year ago. Compared with the preceding month, September's liabilities showed a decline of fully 40 per cent. Moreover the liabilities for last month were below the figures for September, 1924, 1923 and 1921.

Bradstreets Index

SEPTEMBER brought another short downward swing in the commodity price level as measured by Bradstreet's wholesale price index. The recession of slightly more than 1 per cent during the month resulted from weakness in livestock, fruits, hides and leather, textiles, oil and miscellaneous products—six groups in all. The declines were slightly more than sufficient to offset gains in breadstuffs, provisions, metals, coal and coke, naval stores and building material. The index is below that of one year ago.



Demand Ebbs, but Production Holds

Iron, Steel Orders Fall Back to Level of Shipments—Pig Iron Firmer—Rail Awards Heavy—Shipyard Needs Expand

NEW business in iron and steel, considering all products, has subsided to a parity with production and for the first time since mid-September does not afford a margin for backlogs. Orders for the month to date, however, maintain a slight lead over the corresponding period of September, and October will approximate last month on a tonnage basis even though the crest of buying has passed.

Good Fourth Quarter Seems Assured

Deliveries of finished steel continue to disappoint consumers despite an average operating rate in excess of 85 per cent. Some important users, as a result, are specifying a little farther ahead than usual. Each passing week confirms the high expectations for the fourth quarter and the momentum already acquired seems to insure the present gait, or substantially it, for the remainder of the year.

Seasonal buying of track material is under way and some large rail tonnages are being closed. This business is no production aid to railmakers at present but augurs well for the first half of 1929. The railroads are also slightly more interested in equipment. In the face of approaching inventory-taking by some of the larger automotive producers, Detroit looks to fourth quarter output as the highest of the year.

Shipbuilding in the East is beginning to feel the stimulus of the Jones-White act; pending inquiry for ship material exceeds 40,000 tons, and twice that tonnage is additionally in prospect. Building steel requirements are steady, with outlook for winter activity bright. The usual rush to round out roadbuilding programs before cold weather is accelerating reinforcing bar demand.

Most Steel Price Advances Accepted

Barring some shading in the lighter steel products, such as wire and strip, the price situation grows more favorable to producers. In heavy finished steel and in sheets price has deteriorated as a market factor and the advances have generally been accepted. Semifinished steel is $1 stronger at Cleveland. Pig iron prices benefit from the fact that steelworks have little or no merchant iron to spare, and in Cleveland and

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Oct. 17, 1928	Sept., 1928	July, 1928	Oct., 1927
PIG IRON				
Bessemer, del., Pittsburgh	$19.26	18.86	18.76	19.76
Basic, valley	17.00	16.10	15.95	17.00
Basic, eastern, del. eastern Pa.	19.65	19.00	19.00	19.50
No. 2 foundry, del., Pittsburgh	18.76	18.61	18.26	19.26
No. 2 foundry, Chicago	18.50	18.30	17.60	18.75
*Southern No. 2, Birmingham	16.25	16.25	15.50	17.25
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	19.00
**No. 2X, Virginia furnace	20.50	20.50	20.50	21.50
**No. 2X, eastern, del. Phila	21.26	21.01	20.76	20.66
Malleable valley	17.50	17.10	17.00	17.50
Malleable, Chicago	18.50	18.30	17.60	18.75
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.26	18.01	18.76	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	94.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.85	2.75	2.60	2.85
Connellsville, foundry, ovens	3.75	3.75	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	33.00	34.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	32.25	34.00
Billets, open-hearth, Pittsburgh	33.00	32.00	32.25	33.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.50

	Oct. 17, 1928	Sept., 1928	July, 1928	Oct., 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.90	1.85	1.75
Steel bars, Chicago	2.00	2.00	2.00	1.85
Steel bars, Philadelphia	2.27	2.22	2.17	2.07
Iron bars, Chicago	2.00	2.00	2.00	1.90
Shapes, Pittsburgh	1.95	1.30	1.85	1.75
Shapes, Philadelphia	2.11	2.06	2.01	2.07
Shapes, Chicago	2.00	2.00	2.00	1.85
Tank plates, Pittsburgh	1.95	1.90	1.85	1.75
Tank plates, Philadelphia	2.15	2.10	2.10	2.07
Tank plates, Chicago	2.00	2.00	2.00	1.85
Sheets, black, No. 24, Pittsburgh	2.70	2.65	2.65	2.95
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, gal., No. 24, Pittsburgh	3.50	3.50	3.50	3.80
Sheets, black, No. 24, Chicago	2.90	2.85	2.80	3.10
Sheets, blue anl., No. 10, Chicago	2.15	2.15	2.15	2.35
Sheets, galvanized, No. 24, Chicago	3.65	3.65	3.65	3.95
Plain wire, Pittsburgh	2.40	2.40	2.45	2.40
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.30
SCRAP				
Heavy melting steel, Pittsburgh	17.50	16.55	14.10	14.50
Heavy melting steel, eastern Pa.	16.00	14.65	12.75	14.00
Heavy melting steel, Chicago	14.00	12.95	12.30	11.75
No. 1 wrought, eastern Pa.	15.50	15.10	15.25	15.75
No. 1 wrought, Chicago	13.70	12.95	12.30	11.40
Rails for rolling, Chicago	16.50	15.90	14.50	14.70

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.15c to 2.25c
New York, del.	2.225c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago	2.00c to 2.10c
Cleveland, delivered	2.09c to 2.19c
Lackawanna, N. Y.	2.00c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.20c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.11c to 2.16c
New York, del.	2.19c to 2.24c
Boston, del.	2.265c to 2.415c
Chicago	2.00c to 2.10c
Cleveland, delivered	2.09c to 2.19c
Lackawanna, N. Y.	2.05c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.90c to 2.00c
Chicago	2.00c to 2.10c
Birmingham	2.15c
Lackawanna, N. Y.	2.05c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland	1.90c to 2.05c
Philadelphia, del.	2.22c to 2.32c
New York, delivered	2.24c to 2.34c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.90c to 1.95c
Eastern mills	1.85c

IRON

Chicago	2.00c to 2.10c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.30c to 3.00c
Chicago, rail steel	2.00c to 2.60c
Chicago, rail steel, road and bridge work	1.85c to 1.95c
Philadelphia, cut lengths	2.57c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.55c to 3.00c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24.. 4.00c to 4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh base	2.65c to 2.75c
No. 24, Philadelphia, delivered	3.07c
No. 24, Gary, Lndiana Harbor	2.85c
No. 24, Chicago, delivered	2.90c
No. 24, Birmingham, base	2.90c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.90c
No. 28, Gary, base	2.95c to 3.00c

GALVANIZED

No. 24, Pittsburgh, base	3.50c to 3.60c
No. 24, Philadelphia, delivered	3.82c
No. 24, Gary, Indiana Harbor	3.60c
No. 24, Chicago, delivered	3.65c
No. 24, Birmingham, base	3.65c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.00c
No. 24, Philadelphia, delivered..	2.32c to 2.42c
No. 10, Gary, Indiana Harbor	2.10c
No. 10, Chicago, delivered	2.15c
No. 10, Birmingham, base	2.15c

*Plus 0.10 cents for 45 inches or wider.

AUTOMOBILE

No. 20, Pittsburgh, base,	4.00c

FURNITURE

No. 24, Grade A, Pittsburgh	3.85c to 3.90c
No. 24, Grade B, Pittsburgh	3.65c to 3.70c

(*Turn to the following page*)

eastern Pennsylvania the market has been put up. Advances for the first quarter may be expected on some finished steel products in the near future, thereby lending strength to present levels.

Nearly 200,000 tons of rails, including 119,637 tons by the Santa Fe, 46,622 tons by the Erie and 30,000 tons by the Reading, has been placed in the past week. The Burlington is about to act on 30,000 tons, and other western carriers are negotiating at Chicago. The New York Central may pare its 1929 rail requirements to 190,000 tons but the Pennsylvania may top 300,000 tons. The latter carrier is distributing track fastening orders in the East.

Plate Needs in East Expanding

The 40,000 tons of plates for eight steamers now pending in the East and 10,000 tons distributed by the Pennsylvania railroad for cars to be built in its Altoona shops promise to engage eastern plate mill capacity more fully. Six to eight thousand tons of plates is pending at Chicago for west coast oil tanks. Prospective structural shape business is headed by 10,000 tons for a hangar at Akron, O. Bar deliveries are deferred six weeks at Chicago and three at Pittsburgh. Automotive needs still are the mainstay of the sheet mills, with deliveries three weeks or longer on most grades. Chicago producers are considering another advance. Strip mills about hold their backlogs as new orders balance shipments. Manufacturers' wire is in demand, but other wire products lag. A southwestern pipe line for the Roxana Petroleum Co. calls for 45,000 tons.

Shipments of pig iron thus far in October are outrunning September, and despite the lighting of additional blast furnaces recently the pressure for iron is insistent. Such business for the first quarter as has developed thus far has been taken at an increase over the fourth quarter. Cleveland furnaces have advanced 50 cents for local delivery, basic iron is up 75 cents in eastern Pennsylvania, while Valley prices reveal added firmness. Beehive furnace coke is up 10 cents.

All Valley Open Hearths Active

For the first time in history—not even excepting the war days—all available open-hearth steel furnaces in the Mahoning valley are active. At Buffalo 33 out of 37 open hearths are on. Chicago's ingot rate approximates 85 per cent. An important eastern steelmaker is operating better than 90 per cent at present. Steel corporation subsidiaries are at 87 per cent this week.

Continental steel markets as a whole are slightly easier, states an IRON TRADE REVIEW cable from London. Hoopmakers on the continent are organizing for the export trade. Some British tin plate makers are booked far into 1929. Advancing prices continue to raise the IRON TRADE REVIEW composite of 14 leading products. A gain of 15 cents this week brings this index to $35.57, its highest since May.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Oct. 17, 1928)	$35.57
Last week (Oct. 10, 1928)	35.42
One month ago (September, 1928)	35.19
Three months ago (July, 1928)	34.91
One year ago (October, 1927)	35.67
Ten years ago (October, 1918)	57.53
Fifteen years ago (October, 1913)	24.91

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, under 3-inch, Pitts. 2.10c to 2.20c
Hot strip, 3 to 6-inch, Pitts. 2.00c to 2.10c
Hot strip, 6 to 12-inch, Pitts. 1.80c to 1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c to 2.00c plate basis, or 2.00c blue annealed basis.
Hot strip, bands, under 3-in. Chicago 2.30c
Hot strip, bands, 3 to 6-in., Chi. 2.20c
Hot strip, bands, 3 to 12-in., Chi. 1.85c to 2.00c
Hot strip, 12 to 24 in., Chi.... 2.10c
blue annealed sheet basis.
Cold rolled strip, hard coils, 16 inches and wider by 0.100-inch and heavier, base Pitts., Cleve., (3 tons and over)..... 2.75c to 2.85c
Worcester, Mass. (3 tons and over) ..... 3.00c to 3.10c

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.75c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium..	1.50	4.25
Carbon Vanadium	0.95	3.70
9250 (flats)	0.25	3.00
9250 (rounds, squares)	0.50	3.25

TUBING

Boiler
Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 3¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch.... 56
Further discounts of six 5 per cents for 21,000 pounds or more on lap welded steel. On charcoal two 10's and one 2½ on 12,000 pounds or more.

COLD DRAWN SEAMLESS
F.o.b. mill in desirable quantities
Random length over 5 feet .....55 per cent
Selected lengths, 1 to 18 feet .....53 per cent

WIRE PRODUCTS

To Jobbers in Carloads
F.o.b. Cleveland and Pittsburgh base
Dealers 10 cents per 100 pounds extra

Bright plain wire, No. 9 gage.. 2.40c
Annealed fence wire 2.55c
Galvanized wire, No. 9 gage.... 3.00c
Barbed wire, painted 2.95c
Barbed wire, galvanized 3.20c
Per 100 lbs.
Wire nails $2.55
Galvanized nails, plus differ. 4.55
Polished staples 3.00
Galvanized staples 3.25
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply.... 2.55
Woven wire fencing (retailers) 12½ gage, 26-in. high, 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts $20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B Pipe

Six-inch and over, Birming'm $36.00 to 37.00
Four-inch, Birmingham ..... 40.00 to 41.00
Four-inch, Chicago ..... 46.20 to 47.20
Six-inch to 24-inch, Chicago..... 42.20 to 43.20
Four-inch, New York ..... 40.50 to 41.60
Six-inch and over, New York 36.60 to 37.60
Standard fittings, Bir. base..... $100.00

Six to 24-inch base; over 24-inch; plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills..... 2.70c
Cut nails, l.c.l. f.o.b. mills..... 2.80c
Chain, 1-in., proof coil, Pitts.... 6.00c
Sheet piling base, Pittsburgh.. 2.25c

RAILS, TRACK MATERIAL

Standard bessemer rails, mill $43.00
Standard open-h'th rails, mill $43.00
Relaying rails, St. Louis.....$24.00 to 31.00
Relay rails, Pitts. 60 to 90 lb...$22.00 to 27.00
Light rails, 25 to 45, mills..... $36.00
Angle bars, Chicago base..... 2.75c
Spikes, railroad, Pittsburgh.... 2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts..... 2.80c
Spikes, boat and barge, Pitts. 3.00c
Spikes, railroad, Chicago 2.80c
Track bolts, Pitts., steam roads 3.80c
Track bolts, Pitts., stand, jobbers .....70 off list
Track bolts, Chicago 3.80c
Tie plates, Chicago, Pitts..... $43.00

BOLTS AND NUTS

Birmingham and Chicago
Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS
All sizes, cut thread .....60 to 70 off
Rolled thread ⅜x6 and smaller take 10 per cent lower list.
Eagle list ..... 60 to 70 off

MACHINE BOLTS
All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅜x6 and smaller take 10 per cent lower list.
Lag screws ..... 60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads 60 to 70 off
Tap bolts ..... 60 to 70 off
Blank bolts ..... 60 to 70 off
Stud bolts without nuts ..... 60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts .....60-5 off

Nuts
Semifinished .....60 to 70 off

HEXAGON CAP SCREWS
Milled .....80-10-10 off
Upset 1 in. diam. and smaller.....85-5 off

SQUARE HEAD SET SCREWS
Milled .....80-10 off
Upset 1 in. diam. and smaller.....80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.80c to 2.90c
Structural, c.l., Chicago 3.00c
**7/16-inch and smaller, Pitts.....70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.50 to 6.75 off
Wrought, c.l., Chicago dist.....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth .....$33.00 to 34.00
Pittsburgh, bessemer ..... 33.00 to 34.00
Youngstown ..... 33.00 to 34.00
Cleveland 33.00
Philadelphia 38.30
Chicago 33.00
Forging, Chicago 38.00
Forging, Pittsburgh 38.00
Forging, Philadelphia 43.30

SHEET BARS
Pittsburgh $33.00
Youngstown 33.00
Cleveland 33.00
Chicago 34.00

SLABS
Pitts., Young., and Cleve.....$33.00 to 34.00

WIRE RODS
Pittsburgh, Cleveland $42.00
Chicago 43.00

SKELP
All grades, Pitstburgh ..... 1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½% $4.55
Mesabi bessemer, 51½% 4.40
Old range nonbessemer 41½% 4.40
Mesabi nonbessemer, 51½%..... 4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% 8.00
Copper free low phosphorus 58 to 65 per cent ..... nominal

FOREIGN ORE
Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese.. 10.50 to 11.00
North African low phosphorus 10.00 to 11.00
Swedish foundry or basic, 65%—none offered
Spanish and North African basic, 50 to 60 per cent ..... 8.50 to 9.00
Newfoundland foundry, 55%.... 8.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.
Brazilian .....36 to 38 cents
Indian .....35 to 38 cents
Caucasian (53-55 per cent) ....38 to 40 cents

FLUORSPAR

85 and 5 per cent grade
Washed gravel, Kentucky and Illinois mines, per net ton....$16.50 to 17.00
Washed gravel, imported duty paid, east, tidewater, net ton $15.25 to 15.75

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality
Pennsylvania .....$43.00 to 46.00
Ohio ..... 43.00 to 46.00
Illinois ..... 43.00 to 46.00
Kentucky ..... 43.00 to 46.00
Missouri ..... 43.00 to 46.00
Maryland ..... 43.00 to 46.00
Georgia and Alabama ..... 40.00 to 45.00

Second Quality
Pennsylvania ..... 35.00 to 38.00
Ohio ..... 35.00 to 38.00
Illinois ..... 35.00 to 38.00
Kentucky ..... 35.00 to 38.00
Missouri ..... 35.00 to 38.00
Maryland ..... 35.00 to 38.00
Georgia and Alabama ..... 30.00 to 35.00

SILICA BRICK
Pennsylvania 43.00
Joliet, Ill., East Chicago, Ind.... 52.00
Brimingham ..... 50.00 to 51.00

MAGNESITE BRICK
Per Net Ton
9 x 4½ x 2½ 65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base
Dead-burned grain magnesite.... 40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base
9 x 4½ x 2½ 45.00

Pig Iron

Market Is Strong, Shipments Ahead of September—Prices Higher in Ohio—Basic Up 75 Cents in Eastern Districts

WHILE some blast furnace interests, operating at capacity, are unable to keep up with demand for shipments, the lighting of additional stacks in some districts in the past few weeks has relieved pressure. Melters have been ordering so heavily that some pig iron producers believe there will be a substantial carry-over into the first quarter. Enough business for that period has not developed to indicate a definitely higher price, though some sellers are obtaining more than their recent quotations for fourth quarter. Shipments are far ahead of the comparable period in September. More valley producers are asking $17.50, base, for foundry iron, and the only Cleveland maker in the market has advanced its price 50 cents for local and outside delivery.

PITTSBURGH, Oct. 16.—Pig iron prices are firm, although no appreciable change in demand is noted. Basic iron is holding at $17, valley, with most sellers in this district out of the market, owing to lack of supplies to sell. Most consumers are fairly well covered for the remainder of the year, but some are expected to be forced to seek additional supplies within the next month. American Steel Foundries is inquiring for 3000 to 5000 tons of basic for Alliance, O. An attempt is being made to establish $17.50, valley, for No. 2 foundry iron. Several sellers have announced this as their current asking price, although an adequate test is not yet provided, and iron still is available at $17. One interest reports sales in small lots at $17.50. Activity continues restricted to a few carloads at a time. Bessemer is firm at $17.50, valley, although not particularly active. Malleable is holding at the same level. A considerable tonnage of pipe iron has been sold in the Pittsburgh district recently.

Boston, Oct. 16.—Pig iron sales in this district amounted to 3500 tons in the past week. Mystic Iron Works booked about half of the total. A few hundred tons of Indian iron was sold. Stocks at furnaces are low. The heavy melt at local foundries is attributed mainly to the fact machine tool builders, stovemakers and some other lines are at their peak point of production for this year.

New York, Oct. 16.—About 7500 tons of foundry iron was sold to consumers in the past week. New inquiries call for 2500 tons, one involving 1200 tons. Prices are firm. Buffalo foundry iron for this district is bringing $17, base, furnace. Most sales of Buffalo iron now are on the basis of rail shipment, as practically all of the iron that will come through the canal this season has been sold. Consumption continues high and consumers are specifying actively.

Philadelphia, Oct. 16.—Increased operations at eastern steel mills have resulted in the placing of considerable basic pig iron during the past week. It is expected further tonnage will be placed this week. Basic now is $19.65 to $20, delivered, eastern Pennsylvania consuming points, an advance of 75 cents per ton. Foundry iron is firm at $20, base, furnace. The $20.50 price has not been fully established. New business in foundry iron continues fair. Specifications are high. In some instances, eastern Pennsylvania producers have declined orders for large tonnages, not being able to spare the iron.

Buffalo, Oct. 16.—New pig iron sales are small. Shipments are heavy, however, with some furnaces pressed for deliveries. A district melter wants 500 tons of malleable. Prices are firm.

Youngstown, O., Oct. 16.—The pig iron market is rather uncertain as to quotations on certain grades but the tendency is upward. Basic is scarce here and $17, valley, is purely nominal, with next sales likely to bring out $17.50. One valley merchant furnace interest has sold 1200 tons of No. 2 foundry in the past few days, including one lot of 600 tons, at $17.50, valley furnace. Bessemer is unavailable from steel works furnaces in quantity, and one merchant interest here refuses to part with its available stock even at $18, valley, evidently expecting $18.50. Malleable is being sold at $17.50 by some and $18 is asked by other producers.

Cleveland, Oct. 16.—Strong conditions continue to prevail in the pig iron market. Shipments are ahead of those in the comparable period of September, and a leading merchant producer will break all of its prior shipping records this month "if the iron is procurable." Steelworks have increased their requirements for pig iron so much recently that makers with steelworks connections are a little apprehensive about obtaining sufficient iron to supply their merchant trade. Sales booked by all Cleveland furnace interests in the past week totaled 26,800 tons, about 5000 tons less than in the week preceding. One producer booked about 6000 tons for first quarter. Current inquiries for that period total 4500 tons. A Muncie, Ind., malleable consumer that issued an inquiry for 6000 tons has decided not to buy at present. Prices show a rising tendency. One Cleveland producer is out of the market for fourth quarter, and in view of the stronger price position in the valley, the other local producer now quotes $18.50, base, furnace, minimum for delivery in the local 50-cent switching area, marking an advance of 50 cents in the past week. This interest also has advanced its price 50 cents to $18, base, furnace for delivery in outside territory. About 3000 tons of silveries was sold recently by a lake producer at the prevailing Jackson county base schedules.

Detroit, Oct. 16.—Some flywheel, cylinder block and other automobile casting foundries are active in specifying on their pig iron arrangements but a few will be still busier in the near future. Castings for a 6-cylinder car shortly to make its appearance will furnish numerous orders, as high productive schedules are contemplated. The substitution of malleable castings

(*Concluded on Page* 1025)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$17.50
Bessemer, del. Pittsburgh	19.26
Basic, valley furnace	17.00
Basic, del. Pittsburgh	18.76
Basic, Buffalo furnace	17.00
Basic, del. eastern Pa.	19.65 to 20.00
Malleable, valley furnace	17.50
Malleable, del. Pittsburgh	19.26
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	18.00
Malleable, del. eastern Pa.	20.50 to 21.50
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	21.76
No. 1X, Buffalo furnace	19.00
No. 2 foundry, valley furnace	17.00 to 17.50
No. 2 foundry, del. Pittsburgh	18.76 to 19.26
No. 2 plain, Buffalo furnace	17.50
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	19.00
No. 2 plain, del., Phila.	20.76
No. 2 plain, Virginia furnace	20.00
No. 2 plain, N. J., tidewater	20.01 to 21.28
No. 2 Alabama, Birmingham	16.25
No. 2 Alabama, del. Cincinnati	19.94
No. 2 Tenn., Birmingham base	16.25
No. 2 Tenn., del. Cincinnati	19.94
No. 2 Alabama, del. Chicago	22.26
No. 2 Alabama, del. Cleveland	22.51
No. 2 Alabama, del. St. Louis	20.67
No. 2X, east, N. J., tidewater	20.51 to 21.78
No. 2X, eastern, del. Phila.	21.26
No. 2X, foundry, Buffalo furnace	18.00
No. 2X, eastern, del. Boston	20.91 to 21.41
No. 2X, Virginia furnace	20.50
Gray forge, val., del. Pittsburgh	18.26
Low phos., standard, valley	26.50 to 27.00
Low phos., standard, Phila	24.26 to 24.76
Low phos. copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00
Basic, del. Montreal	24.00

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Coke

Beehive Market Stronger, with $2.85 Now Price of Furnace Grade—Foundry Shipments Up

DEMANDS for furnace and foundry grades of coke continue to increase. Due to a lack of surplus, beehive furnace coke is up 10 cents to $2.85 in the spot market, but makers will not light additional ovens until $3 is minimum. Steelworks are taking beehive coke to round out their output of by-product fuel. Foundry coke shipments continue to improve.

Pittsburgh, Oct. 16.—Beehive coke is stronger, due to slightly better demand and lack of surplus. Standard furnace coke is bringing $2.85 in spot transactions. While $2.75 generally has disappeared, producers are not disposed to operate additional ovens, with coke bringing less than $3. Heavier consumption has improved the tone of the market. Several steel mills are required to supplement their by-product coke output with beehive purchases. Foundry coke demand is steady, with $3.75 generally quoted. Some coke of poorer quality is sold at $3.50, while premium brands bring as high as $4.85. The market for heating coke is at a standstill, the recent upturn being retarded by mild weather.

Production of coke in the Connellsville region in the week ended Oct. 6 was 44,830 tons, compared with 39,320 tons the preceding week, according to the *Connellsville Courier*.

Boston, Oct. 16.—The coke market is active and strong. Another battery of ovens has been lighted. Requirements indicate a marked increase in the melt by New England foundries.

Detroit, Oct. 16.—Foundries continue to furnish shipping instructions on by-product coke as they need it. They are not stocking ahead and usually unload direct from car to cupola. A few are increasing their orders from two to three carloads weekly. The price is unchanged at $8.50, ovens or $9, delivered in Detroit.

St. Louis, Oct. 16.—Demand for metallurgical coke continues satisfactory, with the rate of shipments since Oct. 1 slightly better than the average of August and September. Ordering by western and southwestern foundries has increased. Prices are steady.

Birmingham, Ala., Oct. 16.—Local coke consumption has improved slightly, and shipments of foundry fuel outside this district have increased. Prices are steady.

Cincinnati, Oct. 16.—The movement of foundry and domestic coke this month is ahead of that of September. Prices are firmer than at this time last month. Some ovens are out of the market. Predictions are made that there will be no changes in November price lists.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.85 to 3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.50 to 7.00
New River furnace	6.50
Wise county foundry	4.50 to 5.25
Wise county furnace	3.75 to 4.25
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	8.25
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	9.00

Ferroalloys

Shipments Continue Heavy—English Spiegeleisen Sent by Lake

Chicago, Oct. 16.—A middle interest here has unloaded 1200 tons of English spiegeleisen, shipped to Montreal and thence transferred by lake vessel to Chicago, thus saving rail freight from New Orleans. The tonnage was distributed among three or four local consumers at approximately eastern base prices. Shipments of ferromanganese and ferrosilicon on contracts are active.

Pittsburgh, Oct. 16.—Ferroalloy activity consists mainly of shipments against contracts, although ferromanganese sellers are receiving an occasional spot order for quick shipment. On all business, $105, duty paid, seaboard, is firm. Specifications are high. Sellers believe the bright outlook for continued heavy steelmaking operations indicates that the fourth quarter tonnage will be close to a record. Spiegeleisen shipments continue active, with a few spot orders being received for 19 to 21 per cent at $33, furnace. This buying also is for immediate shipment. Ferrochrome, ferrovanadium and ferrotungsten are in good demand.

All Valley Open Hearths Are Active

Youngstown, O., Oct. 16.—All available open-hearth furnaces in the valley district today are producing steel, this including 51 independents and 15 Carnegie Steel. Never in the industrial history of the valleys, even including war days, has this been possible to say. Independent steel bar mills are 75 per cent active, and the Carnegie Steel 80 per cent. Independent sheet mills have 115 units active out of a total of 127.

Strip mills are operating at capacity, but tin plate mills are 75 per cent active, a drop from the former 90 per cent. The drop is usual at this time of year, with mills in between seasons of the end of the canning demand and the new 1929 demand not expected to be manifest until late in November. Pipe production is good, with 13 welded units active out of 18, beside the two seamless units being active.

Corp. Unfilled Orders Up Fourth Month

For the fourth consecutive month unfilled bookings of the United States Steel Corp. have shown a gain, the total as of Sept. 30, amounting to 3,698,368 tons. This is an increase of 74,325 tons or 2.05 per cent. At the end of September, 1927, unfilled orders had shown a decline after an increase in each of the five preceding months, and amounted to 3,148,113 tons, or approximately 550,000 tons under the recent total. Comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Sept. 30, 1928	3,698,368	74,325	+ 2.05	+
Aug. 31, 1928	3,629,042	53,116	+ 1.4	+
July 31, 1928	3,570,927	66,082	— 1.81	+
June 30, 1928	3,637,009	220,187	+ 6.45	+
May 31, 1928	3,416,822	455,311	—11.7	—
Apr. 30, 1928	3,872,133	463,073	—10.7	—
Mar. 31, 1928	4,335,206	62,983	— 1.43	—
Feb. 29, 1928	4,398,189	122,242	+ 2.8	+
Jan. 31, 1928	4,275,947	303,073	+ 7.62	+
Dec. 31, 1927	3,972,874	518,430	+15.	+
Nov. 30, 1927	3,454,444	113,404	+ 3.39	+
Oct. 31, 1927	3,341,040	192,921	+ 6.1	+
Sept. 30, 1927	3,148,113	47,924	— 1.49	—
Aug. 31, 1927	3,196,037	54,023	+ 1.7	+
July 31, 1927	3,142,014	88,768	+ 2.8	+
June 30, 1927	3,053,246	2,305	+ 0.075	+
May 31, 1927	3,050,941	405,191	—11.7	—
Apr. 30, 1927	3,456,132	97,008	— 2.72	—
Mar. 31, 1927	3,553,140	43,979	— 1.22	—
Feb. 28, 1927	3,597,119	203,058	— 5.34	—
Jan. 31, 1927	3,800,177	160,792	— 4.5	—
Dec. 31, 1926	3,960,969	153,522	+ 4.1	+
Nov. 30, 1926	3,807,447	123,786	+ 3.36	+
Oct. 31, 1926	3,683,661	90,152	+ 2.50	+
Sept. 30, 1926	3,593,509	51,174	+ 1.42	+
Aug. 31, 1926	3,542,335	60,187	— 1.67	—

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace	33.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	96.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.00

*These prices contract; spot $5 higher.

Scrap

Prices Continue to Rise—Many Dealers Caught by Short Sales —Market Strong

STEADILY higher prices apply on iron and steel scrap in spite of much resistance on the part of consumers. Dealers with contracts are taking losses in many cases. Some shortage is evident and heavy railroad offerings are not sufficient to meet demands. Consumers have small stocks and melt is high.

Chicago, Oct. 16.—Further advances are shown in consumer purchasing of several grades of iron and steel scrap, in which scarcity continues. Well sustained steelworks and foundry operations, the potentiality of the Gary mills as purchasers, and strength in outlying markets are factors. The top price for heavy melting steel now is $14.50, an advance of 50 cents in the week. No heavy tonnage sales have been made at above $14, but in the past several days numerous small-lot purchases were reported at $14.50. These range mostly in lots of 200 to 500 tons. Santa Fe railroad, in an offering of about 5000 tons of scrap, sold more than 1000 tons of heavy melting steel, for which dealers paid $14.90, gross, delivered in the Chicago switching district. Rail scrap continues strong. Cast scrap likewise is more vigorous. Two consumers have been offering $11 for cast borings, an advance of 25 cents.

Boston, Oct. 16.—Scrap brokers continue to find good demand from the Pittsburgh district. Shipments through the past week were mainly for that district and on a brisk demand for heavy melting steel prices were firmer.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.00 to 10.75
Boston, dealers	11.25 to 11.75
Buffalo, No. 1	15.50 to 16.50
Buffalo, No. 2	13.00 to 13.50
Chicago	14.00 to 14.50
Cincinnati, deal.	13.50 to 14.00
Cleveland, No. 1	14.25 to 14.50
Cleveland, No. 2	13.25 to 13.50
Detroit, No. 1	13.00 to 13.50
Detroit, No. 2	11.00 to 11.50
Eastern Pa.	15.50 to 16.00
Eastern Pa. No. 2	12.50 to 13.50
Bethlehem, deliv.	14.50 to 15.00
N. Y., deal., R. R.	12.00 to 12.50
N. Y., deal., yd.	9.00 to 9.50
Pittsburgh, No. 1	17.50 to 18.00
St. Louis, No. 1	13.00 to 13.50
St. Louis, No. 2	12.25 to 12.75
Valleys, No. 1	15.50 to 16.00

COMPRESSED SHEETS

Buffalo	13.50 to 14.00
Chicago	12.25 to 12.75
Cleveland	13.50 to 14.00
Detroit	13.00 to 13.25
Pittsburgh	17.00 to 17.50
Valleys	15.50 to 16.00
E. Pa. new mat.	13.00 to 13.50

BUNDLED SHEETS

Buffalo	10.50 to 11.00
Cincinnati, deal.	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.25 to 14.75
St. Louis	8.00 to 8.50

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	9.50 to 10.00
Detroit	8.00 to 8.50
St. Louis	8.00 to 8.50

STEEL RAILS, SHORT

Birmingham	10.50 to 11.00
Boston	8.25 to 8.75
Buffalo	16.50 to 17.50
Chicago	16.75 to 17.25
Cincinnati, deal.	18.25 to 18.75
Detroit	17.00 to 17.50
St. Louis	17.00 to 17.50

STOVE PLATE

Birmingham	13.00 to 13.50
Boston consumers	10.50 to 12.50
Buffalo	14.25 to 14.75
Chicago, net	11.50 to 12.00
Cinn., deal., net	9.50 to 10.00
Cleveland	10.00 to 11.00
Detroit, net	10.75 to 11.25
Eastern Pa.	12.50 to 13.00
N. Y., deal., mill	8.75 to 9.25
Pittsburgh	11.50 to 12.00
St. Louis	12.00 to 13.00

SHOVELING STEEL

Chicago	14.00 to 14.50
Pittsburgh	12.50 to 13.00
St. Louis	12.75 to 13.25

KNUCKLES, COUPLERS SPRINGS

Buffalo	16.00 to 18.00
Chicago	15.50 to 16.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	19.00 to 19.50
St. Louis	14.50 to 15.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	21.00 to 21.50
Cincinnati, deal.	13.50 to 14.00
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	21.00 to 21.50
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	15.25 to 15.75
St. Louis	14.50 to 15.00

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	16.00 to 16.50
St. Louis	13.50 to 14.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	10.50 to 11.00
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	15.00 to 15.50
Chicago, No. 1	13.70 to 14.30
Chicago, No. 2	14.00 to 14.50
Cinn., No. 2	13.50 to 14.00
Eastern Pa.	15.00 to 16.00
N. Y., No. 1 deal.	11.50 to 12.00
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	17.50 to 18.00
St. Louis, No. 1	12.00 to 12.50
St. Louis, No. 2	13.00 to 13.50

WROUGHT PIPE

Boston, dealers	9.00 to 9.50
Eastern Pa.	14.50 to 15.00
Buffalo	12.00 to 12.50
New York, deal.	10.75 to 11.25

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	15.00 to 15.50

BUSHELING

Buffalo	14.00 to 15.00
Chicago, No. 1	12.00 to 12.50
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	10.75 to 11.25
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	10.50 to 10.75
Detroit, No. 1	11.50 to 12.00
Detroit, mixed	7.25 to 7.50
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.50
Buffalo	7.50 to 8.50
Chicago	7.50 to 8.00
Cincinnati, deal.	8.75 to 9.25
Cleveland	9.50 to 10.00
Detroit	8.50 to 8.75
Eastern Pa.	11.50
New York, deal.	8.00 to 8.50
Pittsburgh	11.25 to 11.75
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS For blast furnace use

Boston, dealers	6.50 to 7.00
Buffalo	10.50 to 11.00
Cincinnati, deal.	9.00 to 9.50
Cleveland	10.50 to 10.75
Detroit	8.50 to 9.00
Eastern Pa.	10.00 to 10.50
New York, deal.	7.00 to 7.50
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem	9.50 to 10.00
Boston, dealers	6.00 to 6.50
Buffalo	10.50 to 11.00
Chicago	10.50 to 11.00
Cincinnati, deal.	9.25 to 9.75
Cleveland	10.50 to 10.75
Detroit	8.50 to 9.00
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	7.25 to 7.50
Pittsburgh	12.50 to 13.00
St. Louis	9.50 to 10.00
Valleys	12.50 to 13.00

PIPE AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal.	8.25 to 8.75

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago, net	12.25 to 12.75
Cincinnati	9.50 to 10.00
Eastern Pa.	12.50 to 13.00
New York, deal.	9.25 to 9.75
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.00 to 12.50
Chicago	9.00 to 9.50
Cleve., over 10 in.	12.25 to 12.75
Detroit	11.00 to 11.50
Pittsburgh	14.00 to 14.50

FORGE SCRAP

Boston, dealers	6.00 to 6.50
Chicago	16.50 to 17.00
Eastern Pa.	11.50 to 12.50

ARCH BARS AND TRANSOMS

Chicago, net	20.50 to 21.00
St. Louis	19.50 to 20.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.50 to 7.00
Buffalo	12.00 to 12.50
Chicago	11.00 to 11.50
Cleveland	12.50 to 13.00
Eastern Pa.	12.00 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston, ship point	16.00 to 16.50
Buffalo	17.75 to 18.25
Chicago	17.90 to 18.50
Cleveland	16.00 to 16.50
Eastern Pa.	22.00
Pittsburgh	20.50 to 21.00
St. Louis	18.50 to 19.00

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	20.00
New York, deal.	15.00 to 16.00
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 12.50
Boston, con.	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	16.00 to 16.50
Chicago, iron	13.25 to 13.75
Chi., rolled steel	17.00 to 17.50
Cincinnati	12.50 to 13.00
Eastern Pa., cast	16.50 to 17.00
Eastern Pa. rolled	17.00 to 17.50
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	19.50 to 20.00
St. Louis, iron	13.25 to 13.75
St. Louis steel	15.50 to 16.00

No. 1 CAST SCRAP

Birmingham, cup.	14.00 to 14.50
Buffalo	15.00 to 15.50
Boston, textile	15.50 to 16.00
Chicago, mach.	16.50 to 17.10
Chicago, railroad	15.95 to 16.50
Chicago, agri.	14.85 to 15.40
Cincinnati, mach. cupalos, net deal.	16.00 to 16.50
Cleveland, cupola	16.50 to 17.00
Detroit, net	12.75 to 13.25
Eastern Pa. cupola	16.50 to 17.50
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	14.75 to 15.25
San Fran., del.	13.50 to 14.00
Seattle	15.50 to 15.75
St. Louis	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	12.50 to 13.00
Cleve., breakable	12.50 to 12.75
Detroit, auto., net	19.00 to 19.50
Eastern Pa.	16.50 to 17.00
New York, deal.	12.50 to 13.00
Pittsburgh	14.00 to 14.50

MALLEABLE

Boston, railroad	13.50 to 14.50
Buffalo	15.50 to 16.00
Chicago, agri.	13.00 to 13.50
Chicago, railroad	15.00 to 15.50
Cinn., R. R., deal.	14.00 to 14.50
Cinn., agri., deal.	13.00 to 13.50
Cleveland, agri.	15.00 to 15.50
Cleveland, rail.	16.00 to 16.50
Detroit, auto	14.50 to 15.00
Pittsburgh, rail.	14.00 to 14.25
St. Louis, rail	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING 5 feet and over

Birmingham	10.50 to 11.00
Boston, dealers	10.50 to 11.00
Buffalo	14.75 to 15.25
Chicago	16.50 to 17.00
Eastern Pa.	14.50 to 15.00
New York	11.50 to 12.00
Pitstburgh district	17.50 to 18.00
St. Louis	15.00 to 15.50

LOCOMOTIVE TIRES

Chicago, No. 1	14.50 to 15.00
Chicago, cut	16.50 to 17.00
St. Louis, No. 1	12.25 to 12.75

LOW PHOS. PUNCHINGS

Chicago	15.50 to 16.00
Pittsburgh	17.00 to 17.50

No. 1 steel was $11.25 to $11.75, while No. 2 steel brought $9.25 to $9.75. Turnings, cast iron borings and pipe figured rather well for the week.

New York, Oct. 16.—Dealers have again advanced buying prices on several grades of scrap. They are now offering $12 to $12.50, New York, for No. 1 railroad steel; $8 to $8.50 for turnings; $10.75 to $11.25 for wrought pipe and $10 to $10.50 for stove plate for foundry consumption. The latter grade is scarce and on recent purchases consumers have been forced to raise their prices. Yard steel for eastern consumption is unchanged at $9 to $9.50, New York, but for western Pennsylvania shipment, where the material is strictly No. 2 steel, prices are about $1 higher.

Philadelphia, Oct. 16.—Several eastern steel mills have bought No. 1 heavy melting steel during the past week, the total involving close to 20,000 tons. For this material $16, delivered, was paid. Dealers still are offering $15.50, delivered, for No. 1 heavy melting steel, excepting at Bethlehem, where they are paying $14.50 to $15, delivered, for shipment on contracts booked at $13 some time ago. Steel shafting now may be quoted at $20, because consumers generally have declined to pay $21.

Buffalo, Oct. 16.—Melters are reluctant to buy scrap at the higher prices sought by dealers. Consequently little new business is being done but large deliveries are being made on orders and dealers are making the market active. Not much new material is coming here when other districts compete, as values at Buffalo still are somewhat below those in nearby areas, in spite of recent advances. The market is regarded as having considerable latent strength in spite of small sales.

Pittsburgh, Oct. 16.—Iron and steel scrap prices continue strong, although the market is not particularly active as to mill buying. Heavy melting steel is being held close to $18, following purchase at several points at that figure recently. Dealers who sold short a few weeks ago now encounter trouble in covering. Some who sold at $17.25 now are offering $17.50 in an attempt to obtain material, but are not finding supplies plentiful. Although one mill still is deferring shipments on borings and turnings, this condition is not universal and all mills are taking shipments in good volume.

Cleveland, Oct. 16.—Buying of scrap by dealers on orders still features the market. No fresh orders are expected prior to Nov. 1. As high as $14.50 has been paid on No. 1 heavy melting steel for delivery to one local mill. Consumption still is high and mills who thought they were well fixed until spring may have to enter the market earlier. Several grades have been advanced 25 to 50 cents per ton. Valley prices too increase in strength, No. 1 heavy melting and hydraulic compressed going up 50 cents.

Cincinnati, Oct. 16.—Iron and steel scrap continues strong and railroad lists went at better prices than in September. Advances at Pittsburgh are having a strengthening effect here.

St. Louis, Oct. 16.—Iron and steel scrap shows further strength, and with supplies scant and consumer demand active, further advances are expected. Two steelmaking interests are in the market for round tonnages and lesser users are urgently seeking supplies. Thus far, however, buyer resistance to prices has been vigorous, and relatively small quantities have changed hands. In addition to demand from melters, strength is added by efforts of dealers to cover on short sales. Middlemen are experiencing trouble in securing material to apply on orders, and are bidding strongly on railroad lists.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	7.50

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.50
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable, (net)	13.00
Stove plate (net)	9.00

Birmingham, Ala., Oct. 16.—Much old material is moving, though the market is not active. Heavy melting steel is still holding at $10 to $10.75.

Toronto, Ont., Oct. 16.—A brisk spot demand continues to feature the iron and steel scrap market. Advance buying is at a standstill. Heavy melting steel, for which Toronto dealers are offering $9.50, gross, is in strong demand in the Toronto and Hamilton districts, and machinery cast, for which local dealers are offering $15, net, is moving freely to consumers. Both Toronto and Montreal dealers report good spot demand for scrap.

Detroit, Oct. 16.—The scrap market still is hot. It will be more so if mill operations keep up to present high rates. Buying by dealers to cover shorts is prominent. Some local sellers lost out in the distribution by automobile plants of their October scrap production, not being willing to bid as high as some outsiders who have heavy shorts to cover. One Ohio seller is understood still to be 125,000 tons short in the Mahoning valley, comprising mostly bundled sheets. Machine shop turnings were sold at $8.75 late last week, that being the top figure then available. Heavy melting steel No. 1 is quoted at $13.00 to $13.50, although with $18 sales at Pittsburgh, $14 already is thought to be in sight here. No. 1 busheling and forge flashings are up $1.

Semifinished

Market Is Active—$33, Cleveland and Youngstown, on Sheet Bars, Billets and Slabs

MAKERS of semifinished steel are operating at capacity, with specifications heavy and deliveries further extended. Cleveland and Youngstown producers are selling for fourth quarter on a basis of $33 for sheet bars, standard billets and slabs, and $34 for billets under 4 x 4 inches. Chicago producers have sold 10,000 to 15,000 tons of rerolling recently.

SEMIFINISHED STEEL PRICES, PAGE 1010

Chicago, Oct. 16.—Larger consumers of semifinished material who buy in the open market have closed for the quarter. About 10,000 to 15,000 tons of rerolling billets was booked in the past several weeks. Recent orders for rerolling billets were slightly under the base price, $33 to $34, Pittsburgh. Forging billets, 4 x 4-inch base, are quoted on the basis of $38, Chicago. Sheet bars are $34, Chicago. Wire rods have been marked down from $45 and now are quoted at $1 above the Pittsburgh-Cleveland price of $42.

Cleveland, Oct. 16.—Demands for sheet bars, billets and slabs continue active, the leading merchant producer here still operating at capacity. Backlogs are sufficient to sustain the present rate of operation through November. Prices for fourth quarter have been put in effect by this interest at $1 a ton advance of third quarter figures. Sheet bars, standard billets and slabs are $33, and billets under 4 x 4 inches $34, base, Cleveland, Youngstown or Pittsburgh.

Pittsburgh, Oct. 16.—Although fourth quarter contracting for semifinished steel is not yet complete, some mills have signed up consumers for 4 x 4-inch rerolling billets and slabs at $34. Some consumers, however, have been able to book their requirements for the remainder of the year at $33. On smaller size billets $35 is quoted. Sheet bars are firm at $33, and forging billets and wire rods command $38 and $42, respectively. Demand for sheet bars is active.

Youngstown, O., Oct. 16.—Most sales of semifinished materials in this district are confined to sheet bars and wire rods. There is good demand for the latter, and a huge demand for sheet bars due to the activity of valley sheet mills. Sheet bars bring $33, Youngstown and Pittsburgh, while wire rods are firmly held at $42, Cleveland or Pittsburgh. Small billets are bringing $34, same bases as sheet bars.

Bars

Specifications at High Rate and Deliveries Further Delayed—Prices Hold Strength

CONSUMERS of steel bars continue to specify fully and considerable additional buying is also being done. Chicago mills are at capacity, with delivery six weeks late in some sections. Pittsburgh mills are also deferring delivery. Activity is greater than usual for this season. Prices are firm. Automotive users are furnishing much tonnage.

BAR PRICES, PAGE 1009

Chicago, Oct. 16.—Bar mills are finding it increasingly difficult to make prompt shipments. Deliveries have been lengthened to more than six weeks in some sizes and sections. Bar mill operations are at capacity, with shipments paralleling specifications. Specifications are above the average weekly rate for this year, but contract and spot sales during the week fell below the high sales mark at the opening of this month. A fair amount of fourth quarter contracting remains to be closed, but sales now are more in the nature of fill-in requirements for contract buyers and spot orders for non-contract consumers. All sources of bar demand are active. Purchases of bars and other finished steel by farm implement makers and tractor builders in the first ten months this year are reported at a record mark.

Additional sales of soft steel bars are reported at 2.10c, Chicago. The price being quoted to railroads for bars, according to mills in this district, is 2.05c. Only preferred quantity buyers get a price under 2.10c.

Alloy steel bar mills are operating at 80 per cent. Rail steel bars are normally active, the price to the manufacturing trade being 1.90c to 1.95c Chicago Heights. Bar iron is 2.00c to 2.10c, Chicago.

New York, Oct. 16.—Steel bar demand continues good although not quite up to average bookings in September. Some mills now are operating at 80 per cent and are scheduled for two to three weeks at this rate. The usual price on steel bars continues 1.95c, base, Pittsburgh, equivalent to 2.29c, delivered New York. In a few cases 1.90c has not disappeared, while on smaller lots the figure is 2.00c, base, Pittsburgh. Makers of iron bars Saturday and yesterday began quoting a minimum price of 1.90c, base, Pittsburgh, equivalent to 2.24c, delivered New York. Previously the prices had ranged from 1.80c to 1.90c, base, Pittsburgh.

Philadelphia, Oct. 16.—Steel bar demand, while not as active as in September, continues good. In several instances steel bars have sold at 1.90c, base, Pittsburgh, but this is exceptional. The usual figure is 1.95c, base, Pittsburgh, while 2.00c is done on small lots.

Pittsburgh, Oct. 16.—Specifications for hot-rolled bars this month compare favorably with the corresponding September period although they lack slightly the active buying rate of the last half of last month. All sellers state, however, that current business is high for this season. Considerable tonnage still is emanating from the automobile and parts industries. Mills are quoting 2.00c, Pittsburgh, on spot business, with specifications at this and lower figures.

Buffalo, Oct. 16.—Bars are selling at a nominal minimum of 2.10c, Buffalo, but shading to 2.05c is reported to have been done on choice business. Steelworks do not make the lower price on ordinary tonnage, it is thought. There are 33 of 37 open-hearth furnaces in operation.

Cleveland, Oct. 16.—New business in soft steel bars is somewhat lighter than a week ago in point of volume although the number of orders holds up. Automotive requirements are a shade off. Accent at present is on deliveries. Local producers of bars quote 1.90c, Cleveland mill, and are well booked. Producers out of the district ask 1.95c to 2.05c, Cleveland.

Detroit, Oct. 16.—Deliveries on some hot bars are 4 to 6 weeks deferred, despite the fact that producers are on a 85 per cent-plus basis. This is forcing users to anticipate their needs more than they have for some time past. Specifications, therefore, are numerous against fourth quarter contracts, which generally are on a higher basis by at least $2, most tonnage now going at 1.95c. Several small spot transactions recently were at 2.00c. For the first time in many years sellers are benefiting during the current quarter when a price advance took effect. Usually they have been so loaded up with tonnage on old protections they did not reach the new bases for three and sometimes six months after they were inaugurated. While October-November tonnage from automotive consumers may be slightly less than the August-September period, December will witness a comeback in specifications on material for shipment in January.

Plates

Eastern Shipbuilding Projects Take 40,000 Tons of Steel—Miscellaneous Requirements Fair

FEATURING the plate market is a mild revival in eastern shipbuilding projects, bids being taken on vessels requiring 40,000 tons of steel, mainly plates. Plate shipments in the eastern district continue heavy. The Pennsylvania railroad has specified 10,000 tons of plates for car construction at Altoona. Further inquiries from the Pacific coast involved 6000 tons.

PLATE PRICES, PAGE 1009

New York, Oct. 16.—Demand for plates is larger than in the corresponding portion of September. Shipments continue heavy. Eastern mills are operating at 85 per cent to full capacity, and all of them are scheduled ahead at these rates for 10 days to three weeks. Bids are being taken for an unusual amount of shipbuilding. This includes four boats for Export Steamship Corp., two for DeGeorgio Fruit Co. one for Eastern Steamship Co. and a tanker for Tidewater Oil Co. These boats will require around 40,000 tons of steel. Dravo Contracting Co., Pittsburgh, is low on 15 barges for New York Central railroad, requiring 2000 tons. Plates are firm at 2.05c to 2.10c, base, Coatesville, equivalent to 2.22½c to 2.27½c, delivered New York, while to points where the Pittsburgh delivered price is the lowest 1.90c, base, Pttsburgh, is used. Some small-lot business is bringing 2.15c, base, Coatesvlle.

Philadelphia, Oct. 16.—Plate demand continues active. Pennsylvania railroad has specified some 10,000 tons of plates for construction of 1000 box car bodies at its shops at Altoona, Pa. The Export Steamship Corp., New York, has an inquiry out for four steamers involving about 21,000 tons. The United States Engineers Corp., New York, is inquiring for a patrol boat involving 250 tons. Bethlehem Shipbuilding Corp. has booked passenger and freight boat for the New England Steamship Co. The order for 20 locomotives for Canadian National railways has been placed with Montreal Locomotive Works. Current prices continue 2.05c to 2.15c, base, Coatesville, equivalent to 2.15c to 2.25c, delivered Philadelphia, while for points to the west, 1.90c, base, Pittsburgh, governs.

Pittsburgh, Oct. 16.—Demand for plates is well maintained and although showing a slight decrease from the active rate of the latter part of September, compares favorably a month ago. A fair volume of plate business

continues to develop from barge awards. Recent activity in this department generally has been confined to from two to five barges at a time, but the rate of awards has been steady. Mills are quoting 2.00c on spot business, with specifications against fourth quarter contracts at 1.90c to 2.00c.

Detroit, Oct. 16.—About 1800 tons of plates are involved in the Detroit river tunnel job for which the Northern Construction Co. was awarded the general contract. The Riter-Conley Co. is low on the steel. Plates are 1.90c to 2.00c, Pittsburgh although most of the orders on books were taken at 1.95c.

Chicago, Oct. 16.—Distribution of plate tonnage for a recent large pipe order has been held up because of financing and franchise arrangements. About 6000 to 8000 tons of oil tankage is on inquiry from the Pacific coast, but oil tankage sales were less than 1500 tons in the past week. Diversified manufacturing lines are giving good support to the plate market. Some shipments are extended three to four weeks. Shipments are as heavy as at any time this year. Operations are above 80 per cent. Further small quantity contract business was written during the week on the basis of 2.10c, Chicago.

CONTRACTS PLACED

2000 tons, five 134,000-barrel tanks, General Petroleum Corp., Los Angeles, to McClintic-Marshall Co.
750 tons, five coal barges for Monessen Coal & Coke Co.; to Riter-Conley Co., Pittsburgh.
500 tons, three flush deck type barges for Ohio River Sand Co., Louisville, Ky., to Dravo Contracting Co.
230 tons, Wenatchee, Wash., irrigation project, to Beall Pipe & Tank Co.

CONTRACTS PENDING

1200 tons, pipe line, Hood River, Oreg.; bids opened.

Routing Restrictions Out

Washington, Oct. 16.—The proposed routing restrictions on iron and steel articles, in carloads, from Steelton, Minn., to all destinations on the Chicago, St. Paul, Minneapolis & Omaha and the Chicago & North Western have not been found justified by the interstate commerce commission in an investigation just completed. The commission has ordered the suspended schedules canceled and the proceeding discontinued.

Chicago at 85 Per Cent

Chicago, Oct. 16.—Steel mills in the Chicago district are engaged at about 85 per cent of ingot capacity, contrasted with about 60 per cent a year ago. The leading interest has 15 of its 27 furnaces active, and 23 of the 36 steelworks stacks in the district are blowing. Bar mills continue at capacity.

Pipe

Cast Pipe Holds Up in East—Oil Company Inquiries for 450-Mile Line Pipe

WESTERN and southern cast pipe demand lags. Warwick, R. I., issues largest inquiry in 10 years, involving 1400 tons. Mammaroneck, N. Y., wants 12,000 feet 16-inch with a quantity of 8 and 12-inch. It may later take 30,000 feet class A. Attleboro, Mass., inquiries for 100 tons of 6-inch. Roxana Petroleum Co. wants 45,000 tons of 10-inch line pipe.

PIPE PRICES, PAGE 1010

Pittsburgh, Oct. 16.—The Roxana Petroleum Co. is inquiring for 45,000 tons of 10-inch pipe for an oil line from McCamey to Houston, Tex., a distance of 450 miles. This job is expected to be closed shortly. General demand for merchant steel pipe continues steady. Current tonnage compares favorably with a month ago, and the outlook is fairly bright for continued activity in drilling in western oil fields. Spang, Chalfant & Co. are operating their seamless tube mills full, and their welded pipe mills at 80 per cent.

Boston, Oct. 16.—Cast iron pipe is not only firm but it is probable smaller sizes will shortly be increased by as much as $1 per ton. The largest individual municipal letting in a 10-year period is up in Warwick, R. I. Its new water system calls for 1400 tons of 6 to 30-inch pipe. Bids are to be opened on Oct. 19. Attleboro, Mass., opens bids Oct. 17 on 100 tons of 6-inch pipe. Private business is satisfactory. Orders continue to involve fair tonnages.

New York, Oct. 16.—Trading in cast pipe is sluggish, with little demand from either private or municipal sources. Notwithstanding a somewhat firmer situation with regard to raw materials, prices are depressed by present inactivity. Few sellers look for improvement before the November elections.

Cleveland, Oct. 16.—Jobbers of merchant full weight pipe continue to order as needed. Building activity is having a seasonal decline and this is reflected in smaller pipe orders. The Hope Engineering Co. will probably close its attractive requirement of line pipe for New Mexico this week.

Detroit, Oct. 16.—Tubular products are in low demand, especially full weight merchant. Building programs have slowed up in many directions and halted in others. The Pure Oil Co. of Chicago, has leased 15,000 acres in Mason county, and 80 acres in Lake county, Michigan, and will drill 15 oil wells. Pipe is being purchased from its usual sources of supply.

Chicago, Oct. 16.—Backlogs of cast iron pipe orders are lower as a result of recent light bookings. No new municipal tonnage is appearing. Contractors are well along with the season's subdivision work and consequently their orders are fewer. A moderate quantity of orders for half-carloads to 250 tons is reported. Chicago shortly will award 250 tons of fittings. The range of $42.20 to $43.20, delivered Chicago, represents the market for the larger sizes.

Birmingham, Ala., Oct. 16.—Lettings are not numerous and the unfilled tonnage in cast iron pressure pipe is being worked down steadily. What few sales are being made are at a firm base price, $37 being asked on 6-inch and over sizes, though the base is quoted at $36 to $37.

CONTRACTS PLACED

844 tons, 8-inch class 350, Los Angeles; to Jones, Lyman Co.
422 tons, 8-inch class 350, Los Angeles; to Pacific States Cast Iron Pipe & Foundry Co.
300 tons, various city of Seattle local improvement projects, to United States Cast Iron Pipe & Foundry Co.
231 tons, 4 to 8-inch class B and C, various street improvement projects, San Diego, Calif.; to unnamed interests.
100 tons, 4 and 48-inch class B, sewer in Glen Holly, Pasadena, Calif.; to unnamed interest.

CONTRACTS PENDING

45,000 tons, 10-inch steel line pipe from McCamey to Houston, Tex., for the Roxana Petroleum Co.
12,000 feet of 16-inch and a considerably smaller quantity of 8 and 12-inch class C pipe for Mammaroneck, N. Y.; this municipality is expected to issue an inquiry later for approximately 30,000 feet of class A pipe.
1400 tons, 6 to 30-inch pipe, water system, Warwick, R. I.
250 tons, fittings for Chicago waterworks department; James B. Clow & Sons, low bidder.
164 tons, 2 to 12-inch class B, Phoenix, Ariz. Bids opened.
100 tons of 8-inch class C water pipe, city of Milwaukee. Bids close Oct. 18.
100 tons, 6-inch pipe, Attleboro, Mass.; bids opened Oct. 17.

France Sends Skelp

Philadelphia, Oct. 16.—Steel imports at this port during the week ended Oct. 13 included 506 tons of steel skelp from France, 402 tons of structural shapes from Belgium and 6 tons of steel bars from Belgium.

Ore imports included 5802 tons of iron ore from Algeria, 1250 tons of manganese ore from British India, and 32 tons of manganese ore from Germany.

Pig iron imports included 500 tons from British India, while imports of

steel scrap included 23 tons from the United Kingdom.

Bolts, Nuts, Rivets

Steady Specifications Against Fourth Quarter Contracts

NUT AND BOLT PRICES, PAGE 1010

Pittsburgh, Oct. 16.—Buyers of bolts, nuts and rivets are specifying steadily against fourth quarter contracts. Railroads show little signs of increased buying and jobbers are indisposed to specify in large lots. Structural rivets for buildingn purposes are slightly less active. Operations hold at 60 to 65 per cent. Prices are firm at 60 to 70 off for bolts and nuts, and 2.90c, Pittsburgh, for large rivets.

Cleveland, Oct. 16.—Nut, bolt and rivet orders, while on a slightly lower scale than in September, are holding up fairly well. Diversified consuming lines are represented on order books, together with a fair sprinkling of jobber specifications. Prices are firm.

Chicago, Oct. 16.—Specifications for bolts and nuts from the farm implement, automotive and miscellaneous metalworking lines are regarded as normal. Railroad and building business has slumped and producers of bolts, nuts and rivets serving those industries are reporting lean specifications. Operations are unchanged at 70 to 75 per cent. Occasional spot orders come into the market but most business consists of specifications against contracts. For spot business 60 to 70 off is quoted for bolts and nuts. Small rivets are 70 to 70 and 10 off.

Tin Plate

Slight Increase in Production Expected at Early Date

TIN PLATE PRICES, PAGE 1009

Pittsburgh, Oct. 16.—Further decline in tin plate operations is noted, the general level here being 75 to 80 per cent. This is in line with the usual seasonal trend and a slight upturn is to be expected shortly when mills start operating on material to be specified against next quarter's requirements. Tin plate continues $5.25 per base box, Pittsburgh.

Alloy Orders Liberal

Detroit, Oct. 16.—All consumers of alloy bars need material, judging from specifications. Deliveries are becoming more deferred. Fourth quarter contracting is practically complete or will be during the forepart of this week when Chrysler Motor Corp. signs up. It has been filling its needs in the prompt market. Higher prices are being observed everywhere. Various automobile companies anticipate that, as a whole, fourth quarter tonnage will equal and possibly exceed third quarter.

Sheets

New Business Shows Moderating Tendency — Prices Firm — Mill Operations Still at High Rate

THE volume of new sheet orders is not so large as during the buying movement in the latter part of September and early days of October, this fact being noted in the eastern markets and Middle West. Sales to the automotive industry are holding up, but other lines show a little slackening, Pittsburgh reports. Prices are steady.

SHEET PRICES, PAGE 1009

Pittsburgh, Oct. 16.—Sheet specifications and operations are well maintained, business so far this month equaling the corresponding period of September. Production is at capacity. Buying by automotive interests continues good. Other important consuming lines show little slackening in specifications. Implement manufacturers still are active and buying by the metal furniture industry shows a substantial gain over a year ago. Export business is heavier. A large tonnage of sheets has been shipped for reconstruction work in the territory visited by the recent tornado. Sellers report little difficulty in obtaining 2.75c, Pittsburgh, for black sheets, while tin mill black is going at 2.90c, Pittsburgh, galvanized at 3.50c, blue annealed at 2.00c, and autobody at 4.00c. Three weeks is about the best delivery offered by any mill.

New York, Oct. 16.—Jobbers placed about 1000 tons of galvanized sheets in the past week at 3.50c, base, Pittsburgh. This established definitely that mills are firm against allowing jobbers the former differential of $2 a ton. In some cases mills quote 3.60c, base, Pittsburgh, on galvanized, but this is not representative. Some buyers try to get blue annealed at less than 2.00c, base, Pittsburgh, but this figure seems to be holding; the extra of $2 a ton on widths over 45 inches is not always obtained. Black sheets continue 2.75c, base, Pittsburgh.

Buffalo, Oct. 16.—Black sheets are firm at 2.75c, base, Pittsburgh. Automobile sheets also are on a sound basis, with order books well filled for this quarter. Buffalo sheet mills are operating at 90 per cent.

Philadelphia, Oct. 16.—Sheet bookings continue good, although the total is not quite as large as in September. The 3.50c, base, Pittsburgh, price on galvanized sheets is firm, and there have been no concessions to jobbers who have been accustomed to buying at $2 under the market. Black sheets continue firm at 2.75c, base, Pittsburgh. Blue annealed sheets are 2.00c to 2.10c, base, Pittsburgh, plus $2 a ton for widths over 45 inches. In a few cases this extra has been waived.

Cleveland, Oct. 16.—Pressure for sheet deliveries is increasing. Several mills cannot ship even common finishes before the week of Nov. 17. Other more highly finished sheet producers cannot promise anything better than Dec. 1 to 10. Automotive demand gives the market its chief support. Prices for the most part are firm at quoted levels, although again one or two mills have quoted $1 or $2 less on black galvanized and blue.

Youngstown, O., Oct. 16.—Specifications continue to pour in on sheet mills. Contracts also are piling up. Independent mills here are operating at 90 per cent, the highest rate so far this year. Mills making common grades of sheets are filled for one month to six weeks ahead, while certain autobody mills are booked practically into next December. Common black sheets are 2.75c, Pittsburgh, with increasing talk of 2.85c by the end of this year. Galvanized sheets bring a minimum of 3.60c while 3.75c is believed coming. Autobody is held at 4.00c, and an advance in this grade is likely. Blue annealed holds at 2.00c or 2.10c.

Chicago, Oct. 16.—Sheet producers are giving further serious consideration to a new price advance. They point out that present quotations are $4 to $6 a ton below a year ago, particularly for galvanized, and that the profit margin is too narrow. Sheet orders are at a slightly lower rate than during the peak of the buying movement but the volume still is good. Deliveries are three to six weeks, the greater length of shipments applying on blue annealed orders. Chicago delivered prices are 2.90c for No. 24 black; 3.65c for No. 24 galvanized; and 2.15c for No. 10 blue annealed.

Detroit, Oct. 16.—Sheet sellers, particularly those supplying the automotive trade, report uninterrupted and in some cases expending demands. Specifications, against quarter contracts are numerous and involve attractive tonnages. December datings already are in evidence particularly on deep drawing stock. Prices are firm at 2.75c, Pittsburgh, for black and 3.50c for galvanized. The 4.00c price is holding on full finished. Blue annealed is subjected to competition from strip mills as well as plate mills, but generally is holding to 2.00c to 2.10c.

St. Louis, Sept. 16.—Sheet specifications are satisfactory and new orders, while individually small, make a good total. Blue annealed and galvanized are the most active. The leading local producer is operating at capacity in all departments, and has business sufficient to maintain that rate through November. Prices are firm.

Structural Shapes

Western Tin Plate Mill Awarded; Takes 2950 Tons—Akron Hangar Requires 10,000 Tons —New York Subway 5000 Tons

STEEL contracts for a tin plate mill at Pittsburg, Calif., feature the structural shape market, the main building taking 2500 tons. The week's awards represent a comparatively fair aggregate, including a few jobs above 2000 tons apiece. Pending inquiries involve large tonnages at New York and Cleveland. Fabricators in northern Ohio are interested in the 10,000-ton hangar job at Akron, O. Chicago reports building construction total for five years to Oct. 1 as being greater by 32 per cent than the total for the preceding 10 years. In Philadelphia, old orders are being worked off faster than they are replaced by new. Both inquiries and awards decline at Pittsburgh. Chicago reports bright prospects for winter building. Shape mills operate at a 75 per cent average.

STRUCTURAL SHAPE Prices Page 1009

Philadelphia, Oct. 16.—Fabricating shops are workin- off orders faster than they are replacing them but this shrinkage has not yet backed up to the mills. Eastern shape mills continue to operate at 70 to 85 per cent. Fabricators while still jammed with work, shortly will be needing orders. Jobbers are not distributing shapes in the volume of two months ago. Shape prices, however, continue to show the firmest tendency in years. Larger fabricators are not able to obtain large differentials under regular market prices. It now is difficult to uncover concessions beyond $1 or $2 per ton. The usual price is 2.05c, base eastern mill, (2.11c, delivered Philadelphia) with 2.10c to 2.15c on smaller lots. Prices vary according to location of mill, consumer and erection site.

On thin-web, wide-flange shapes, one mill quotes net prices and another the base price with extras. Consumers say the two methods cause confusion in making comparisons. At present, the usual extras for these thin-web-wide-flange sections are $1 a ton for beams and $2 a ton for columns, while large columns take an extra of $3.

Boston, Oct. 16.—The situation has remained quiet in structural lines. Various interests point out that the coming election is a factor. They predict little activity for the next three weeks. Despite this dullness, prices are firm.

New York, Oct. 16.—Although active, structural demand is not as brisk as a week ago, particularly as applied to awards. A few are noted involving up to 2000 tons apiece. Subway work again features inquiry, the latest project involving 5000 tons. Shape prices are firm at 2.195c, New York, minimum for large tonnages. Fabricated material quotations are the strongest in a number of weeks, although fabricators assert some irregularities still exist.

Mayor Walker has vetoed the ordinance passed by the board of aldermen amending the building code in regard to working stresses. He will not again consider the proposal until recommendations are available for a complete revision of the code.

Pittsburgh, Oct. 16.—Fabricated structural steel inquiry and awards have declined recently. Most jobs are restricted to small lots. Fabricating shops, however, are busy on old work and specifications for plain material at 1.90c to 2.00c are well maintained. Total tonnage so far this month compares favorably with the first half of September. On new spot business mills quote 2.00c, Pittsburgh.

Buffalo, Oct. 16.—Small lots of shapes are in good demand. The price is 2.05c to 2.10c, Buffalo. A 500-ton lot for a school was placed with the R. S. McMannus Steel Construction Co.

Cleveland, Oct. 16.—Steady specifications are coming to the structural shape mills. Fabricators, however, encounter a lowered inquiry rate and awards are not numerous. American Bridge Co. was awarded the 825-ton job for the General Tire & Rubber Co., Akron O. The hangar job there for the Goodrich-Zeppelin Corp. may reach 10,000 tons. Catenary bridges for the Union Terminals Co., here, require 2000 tons only; electrification work about 200 tons. John Gill & Sons, contractors, seem in no hurry to place 4100 tons for Lakeside hospital buildings. Shapes are 1.90c to 2.00c, Pittsburgh, the bulk of shipments being billed at 1.95c.

Detroit, Oct. 16.—A wealth of specifications have been coming in on structural shapes. This was true during the closing weeks of the third quarter in a marked way but continues thus far in October. Latterly these have applied against fourth quarter contracts, generally $2 per ton higher than third quarter. The bulk of the tonnage is at 1.95c, Pittsburgh, although some shipments are going to large users at 1.90c. A few small spot sales are noted in 2.00c, but that figure is not prevalent. A new building for the Chrysler-Dodge Corp. here came up suddenly and within two days the contract for the steel —1200 tons—was let to Whitehead & Kales. The Riter-Conley Co. is understood to be low on approaches for the Detroit river tunnel, on which the Northern Construction Co. has the general contract. This involves 1800 tons of plates and 2000 tons of structural shapes.

Chicago, Oct. 16.—Considerable contracting for plain structural material with the mills still remains. Specifications are good but contract sales declined from the peak volume of a week ago. Fabricating shops are optimistic about winter building. Indications are that activity this year will surpass last. Farm implement manufacturers are taking steady tonnages of light structural material. The spot and contract price range is 2.00c to 2.10c, Chicago, depending upon quantity.

Construction figures just released show that the volume of building awards in Chicago during the five years ended Oct. 1 were 32 per cent greater than during the preceding 10 years.

Awards Compared

	Tons
Awards this week	19,164
Awards last week	38,823
Awards two weeks ago	61,170
Awards this week in 1927	73,807
Average weekly awards, Sept.	42,968
Average weeklyawards, 1928	39,519
Total awards to date, 1927	1,522,387
Total awards to date, 1928	1,620,313

CONTRACTS PLACED

3400 tons, Y. M. C. A. building, West Sixty-third street, previously noted as placed with unnamed fabricator; to Harris Structural Steel Co.

2500 tons, tin plate mill, Columbia Steel Corp., Pittsburg, Calif.; to McClintic-Marshall Co.

2000 tons, power plant at India Basin, Great Western Power Co.; to Dyer Bros.

2000 tons, George Washington hotel, Twenty-third street and Lexington avenue, New York, to A. E. Norton, Inc.; John B. Peterkin, 285 Madison avenue, architect.

1800 tons, highway bridge, for National Toll Bridge Co., Hermann, Mo.; to Kansas City Structural Steel Co., through the Foundation Co., New York. Previously noted as 2500 tons.

1500 tons, 25-story addition, Law building, Philadelphia; to Shoemaker Bridge Co.

1200 tons, building, Chrysler-Dodge Corp., Detroit; to Whitehead & Kales.

825 tons, building, General Tire & Rubber Co., Akron, O.; to American Bridge Co.

672 tons, Clayton-Lambert building, Fisher Body Corp., Detroit; to Massillon Bridge & Structural Co., through J. A. Utley Co.

610 tons, municipal memorial auditorium, Shreveport, La.; to Orange Car & Steel Co., through Glassell-Wilson Co. Inc., general contractor.

550 tons, bridge, Rock Island railroad, Davenport, Iowa, to American Bridge Co.

500 tons, 9-story apartment, 33-35 Pierrepont street, Brooklyn, N. Y., to Lehigh Structural Steel Co.

500 tons, school, Newark, N. Y.; to R. S. McMannus Steel Construction Co.
300 tons, Adams-Saginaw building, Saginaw, Mich.; to Massillon Bridge & Structural Co., through Flint Structural Steel Co.
300 tons, open-hearth furnace, Columbia Steel Corp., Pittsburg, Calif.; to Dyer Bros.
300 tons, gallery and railing for power house, Philo, O., to Dauchy Iron Works.
270 tons, crane runway, plant No. 37, Fisher Body Corp., Detroit; to Massillon Bridge & Structural Co., through J. A. Utley Co., Detroit.
200 tons, building, Brooklyn Ash Removal Co., Brooklyn; to Shoemaker Bridge Co.
170 tons, apartment, San Mateo, Calif.; to Judson-Pacific Co.
150 tons, plant, Wood Hydraulic Hoist & Body Co., Detroit; to Massillon Bridge & Structural Co.; through Otto Randolph Inc.
150 tons, international bridge over the Rio Grande river at Zapata, Tex.; to Orange Car & Steel Co., Orange, Tex., through George E. Cole, contractor.
150 tons, machine shop, Columbia Steel Corp., Pittsburg, Calif., to Dyer Bros.
148 tons, building, Tainer-Gates Co., Norfleet, Fla.; to Virginia Bridge & Iron Co.
130 tons, girders for Lukens Steel Co., Coatesville, Pa.; to Massillon Bridge & Structural Co.
120 tons, United States post office, East Liberty, Pittsburgh; to Levinson Steel Co.
119 tons, building, Starrett Co., Aberdeen, N. Dak.; to Pittsburgh-Des Moines Steel Co. or Minneapolis Steel & Machinery Co.
100 tons, hay barn, American Milling Co., Omaha, Nebr.; to Paxton & Vierling Iron Works, Omaha.
100 tons, bridge work, Michigan state highway commission; to Massillon Bridge & Structural Co.
100 tons, addition, Oilgear Co., Milwaukee, to Worden-Allen Co.
100 tons, shed extension, Standard Oil Co. of Louisiana; to unnamed interest.

CONTRACTS PENDING

11,500 tons, subway section 2, route 108, New York, J. F. Cogan, Grand Central terminal, that city, low on general contract.
10,000 tons, hangars, Goodrich-Zeppelin Corp., Akron, O.; bids soon.
6000 tons, subway section 3, route 109, New York. General contract awarded to the Clementi Contracting Co., 101 Park avenue, that city.
5000 tons, St. George hotel addition, Brooklyn, N. Y. Previously noted among pending items; now scheduled for letting by Oct. 19.
5000 tons, subway section 6, route 109, Brooklyn; bids scheduled for opening Oct. 26; may be delayed.
4100 tons, buildings, University Hospital association, Adelbert road, Cleveland. General contract to John Gill & Sons.
3800 tons (1800 tons plates—remainder shapes) Detroit river tunnel approaches; general contract to Northern Construction Co.; Riter-Conley Co. low on steel.
2500 tons, 17-story building, Union Gas & Electric Co., Cincinnati. Bids close Oct. 17.
2500 tons, 17 or 18-story building, Central Bank of Youngstown, O.
2000 tons, catenary bridges, Union Terminals Co., Cleveland; bids received.
1500 tons, plant, International Harvester Co., Farm-All tractor works, Rock Island, Ill.
1200 tons, 16-story apartment, Ninety-fourth street and West End avenue, New York.
1000 tons, 16-story apartment, Ninety-sixth street and Park avenue, New York.
750 tons, building, Bell Telephone Co., Wilkes-Barre, Pa.
700 tons, highway bridge over Missouri river at Wolf Point, Mont.
700 tons, column cores, Lackawanna freight terminal, Jersey City, N. J. Specifications expected out in a few weeks; bids being asked now on general contract which will include heavy tonnage of reinforcing bars to be purchased direct.
500 tons, Y. M. C. A., Baltimore.
500 tons, A. D. S. Building Corp., Eighty-eighth street and Fifth avenue.
400 tons, police station, Columbus, O.; bids closed Oct. 12.
350 tons, county bridge, Lorain, O., Wendell P. Brown Co., Cleveland, engineers. Project reopened.
300 tons, Samaritan home, 440 East Eighty-eighth street, New York; previously noted as involving unstated tonnage, with J. F. Jackson, architect.
250 tons, Kingsway hospital addition, Kings

(*Concluded on Page* 1025)

Concrete Bars

Eastern Awards Active—One Job Takes 2000 Tons—Chicago Prices Weak

LETTINGS in concrete bars are active in the East. In most other sections they have halted, except for small tonnage. Five projects are closed in New York, taking 2740 tons, 2000 tons of which is for a warehouse at Albany. Pending inquiries are fair, although a seasonal decline is setting in. A building at Berkeley, Calif., takes 1800 tons.

REINFORCING BAR PRICES, PAGE 1009

Chicago, Oct. 16.—Recent bids on one or two building projects show a sharp drop in quotations for billet reinforcing bars. At least one quotation was on a basis below 2.10c, Chicago. Competition is extremely sharp. Rail steel bar activity is confined to shipments on orders booked in the past month or so. Rail steel bars are fairly firm. Fabricators are seeking to stiffen the minimum above 2.00c, Chicago Heights.

Boston, Oct. 16.—Quietness continues to characterize reinforcing steel. Possibly 150 tons in odd lots figured is the total. Only one or two sizable jobs are projected.

Pittsburgh, Oct. 16.—Concrete reinforcing bar market is quiet as to awards and new inquiry. A job on Neville Island takes 200 tons and one at Columbus 500. Pending work is in fair volume. A fairly active fourth quarter is in prospect. Billet bar prices are firm at 2.25c, Pittsburgh, for cut lengths, and 2.00c for stock lengths.

Buffalo, Oct. 16.—Seasonal decline in reinforcing bar business is noted. A large number of small lots were placed for rush delivery from stock. Mill length business is scarce and probably will be more so. Small lots are moving at 2.51c, Buffalo, delivered from stocks.

Cleveland, Oct. 16.—Concrete bar lettings are few. A warehouse for the Neal Fireproof Storage Co. will take a fair tonnage and additional work for the Union Terminals Co. will likewise prove attractive. The usual price on mill lengths is 2.00c, Pittsburgh. Cut lengths are 2.15c to 2.25c.

CONTRACTS PLACED

2000 tons, warehouse, Albany, N. Y., for Montgomery Ward & Co.; to Kalman Steel Co.
500 tons, grade crossing, Norfolk & Western railroad, Columbus, O., to Truscon Steel Co.
350 tons, Parkwell apartments, Chicago, to Barton Spiderweb System, Inc.
340 tons, subway route 107, section 5, Brooklyn, N. Y.; to Concrete Steel Co., through Necaro Co
300 tons, recreational building, Louisville, Ky.; to Laclede Steel Co.
250 tons, apartment hotel, Chicago, to Inland Steel Co.
200 tons, rail steel, hotel at 617 West Madison street, Chicago, to Olney J. Dean Co.

Awards Compared

	Tons
Awards this week	**5,090**
Awards last week	**8,169**
Awards two weeks ago	**6,515**
Awards this week in 1927	**5,113**
Average weekly awards, Sept.	**5,145**
Average weekly awards, 1928	**6,845**
Total awards to date, 1927	**229,360**
Total awards to date, 1928	**280,657**

200 tons, cement plant, Davision Coke & Iron Co., Neville island, Pittsburgh, to McClintic-Marshall Co.
200 tons, bridge between Palmyra, N. J., and Tacony, Pa., across Delaware river; to Concrete Steel Co.
150 tons, building, Goodyear Tire & Rubber Co., Akron, O.; to Patterson-Leitch Co.
100 tons, rail steel, apartment, Sixty-seventh street and Jeffrey avenue, Chicago, to Olney J. Dean Co.
100 tons, garage, Lamon avenue and Madison street, Chicago, to Calumet Steel Co.
100 tons, subway section 2, route 109, Brooklyn, N. Y.; to Concrete Steel Co., through Rosenthal Engineering Contracting Co. Inc.
100 tons, dormitory for state of New York, Fields, N. Y.; to Fireproof Products Co.
100 tons, sewage disposal plant, Hornell, N. Y.; to Kalman Steel Co.
100 tons, Hoquiam city hall and state highway work to Northwest Steel Rolling Mills.

CONTRACTS PENDING

1800 tons, Life Science building, Berkeley, Calif. Dinwiddie Construction Co. awarded general contract. Bars yet to be placed.
675 ton, warehouse, Sears-Roebuck Co., San Francisco; bids received.
300 tons, bridge over Canal street, Cleveland, Union Terminals Co.; bids in.
248 tons, South Spillway, East Bay municipal utility district, Oakland, Calif.; general contract to Ward Engineering Co.
225 tons, hotel, Santa Cruz, Calif.; general contract to C. Swenson.
190 tons, apartment, 550 Arthington street, Chicago. Koenigsberg & Weisfelt, architects.
164 tons, Rubio storm wash, Los Angeles; bids Oct. 15.
150 tons, Ohio state highway bridge, Cincinnati pike, Montgomery county; bids in.
150 tons, warehouse, Neal Fireproof Storage Co., Lorain avenue, Cleveland; bids closed Oct. 10.
129 tons, highway work in Orange county, Calif. Bids Oct. 30.
100 tons, Pardee reservoir, East Bay municipal utility district, Oakland, Calif. General contract to Ward Engineering Co.
Unstated tonnage, warehouse, New York Steam Corp., East Thirty-sixth street, New York; general contract to Turner Construction Co.
Unstated tonnage, road projects including 88 miles of paving to cost $732,000 and bridge to cost $15,168 for Kentucky state highway commission; general contract for bridge awarded J. U. Schickil, Louisville, Ky.

Rails, Cars

Car Underframes Ordered—Car Inquiries Noted in West—Rail Orders Placed—More Coming

INTERMITTENT car purchases together with rail and accessory order distributions are growing. Great Northern awards 500 and Swift & Co. 300 underframes. Refrigerator and other car inquiries are up in the West. Reading buys 30,000 tons rails; Erie 46,622 tons. Pennsylvania's rail requirements may reach 372,000 tons. Santa Fe has just ordered 119,637 tons of rails.

RAILROAD TRACK PRICES, PAGE 1010

New York, Oct. 16.—Although small, September domestic freight car awards of 1378, based on full returns, are larger than the totals of the preceding two months and compare with 2422 in June. The total for the first nine months is 30,971, against 46,323 in the corresponding period of 1927, 49,720 in 1926 and 35,395 in 1925. Further comparisons follow:

	1928	1927	1926	1925
Jan.	4,160	14,710	8,830	1,695
Feb.	10,220	5,960	12,895	5,510
March	2,958	4,955	8,895	4,730
April	6,043	3,675	4,615	5,060
May	2,531	5,425	4,448	6,985
June	2,422	7,440	4,285	1,835
July	582	2,295	1,265	800
Aug.	677	1,181	152	2,875
Sept.	1,378	682	3,335	7,905
Total (9 mos.)	30,971	46,323	49,720	35,395
Oct.	.....	886	2,840	11,145
Nov.	.....	1,189	3,925	11,685
Dec.	.....	14,897	8,990	16,885
Total	.....	64,042	60,575	77,110

With 1000 freight cars placed by the Pennsylvania with its own shops and substantial inquiry pending, October freight car buying may show a material gain.

While more car inquiry is pending than in some time, most of it is relatively fresh. Few orders are being placed. Locomotive demand is featured by the placing of five additional engines for the Canadian National.

Reading Co. has placed orders for 30,000 tons of steel rails, of which 25,000 tons will be supplied by Bethlehem Steel Co. and 5000 tons by Carnegie Steel Co. Last year Reading Co. placed 35,500 tons of rails.

Pittsburgh, Oct. 16.—Buying of track accessories is fairly steady. Spike business shows little change from the rate a month ago, with the 2.80c, Pittsburgh, price firm. The Reading has distributed tie plate, bolt an spike orders. Light rail buying is quiet. Small orders occasionally are received from coal mining districts.

Philadelphia, Oct. 16.—The Pennsylvania railroad has begun to distribute orders for tie plates, spikes and other track accessories on which it recently took bids.

Detroit, Oct. 16.—Detroit, Toledo & Ironton railroad is inquiring for 13,500 tons of rails. Orders for accessories will probably be placed at the same time.

Chicago, Oct. 16.—Several large western rail inquiries are in the making. At least one road will close soon. Erie has ordered 46,622 tons of rails for 1929, as follows: 24,471 tons to Carnegie, 11,151 tons to Illinois, 7500 tons to Bethlehem and 3500 tons to Inland. Specifications on track fastenings are active. Several lots just closed amounted to about 3000 tons. About 2000 tons of the Chesapeake & Ohio's order for 12,000 to 15,000 tons of track fastenings was distributed to western mills. Great Northern has completed its purchase of about 7000 tons of track accessories. While 1929 rail orders have not as yet been placed upon mill schedules, western mill operations remain at about 50 per cent. The New York Central rail inquiry will total 190,000 tons, including options. Orders for light rails are in miscellaneous lots, the resumption of coal mining in Illinois having but little effect.

Specifications for finished steel to the mills from car building shops were slightly higher last week than in several. A fair amount of repair work was scheduled, but car builders only average 25 to 30 per cent operations. Gray & Southern Traction Co. has purchased two steel interurban cars.

Santa Fe has awarded 119,637 tons of rails, dividing the order three ways between the Colorado Fuel & Iron Co., Illinois Steel Co., and Inland Steel Co., the former receiving 94,000 tons. Chicago, Burlington & Quincy is understood to be closing on 30,000 tons.

CAR ORDERS PLACED

Canadian National, 30 tank cars; to unnamed interest.
Gary & Southern Traction Co., two interurban cars, to unstated builder.
Great Northern, 500 steel underframes; to Pressed Steel Car Co.
Main Central, four steel bax cars; to Standard Steel Car Co.
100 street cars, Detroit United Railways, Detroit; to Perley A. Thomas Car Works, High Point, N. C.
Southern Pacific, 25 dining cars; to Pullman Car & Mfg. Corp.
Swift & Co., 300 underframes, to Bettendorf Corp.
Youngstown Sheet & Tube Co., 200 mine cars; to Enterprise Wheel & Car Corp.

LOCOMOTIVES PLACED

Canadian National, five locomotives, to Canadian Locomotive Co. Ltd.

CAR ORDERS PENDING

Canadian National, reported inquiring for 500 refrigerator cars in addition to other equipment pending.
Delaware, Lackawanna & Western, inquiring for 100 automobile cars.
Northern Refrigerator Car Co., 300 refrigerator cars.
Chicago & North Western, 100 underframes.

German Engineers To Be at Fuel Meeting

Pittsburgh, Oct. 16.—More than 20 German scientists and engineers who are identified with the latest discoveries in the use of bituminous coal and its by-products are expected to address the second international conference on bituminous coal to be held at the Carnegie Institute of Technology, Nov. 19 to 24. Although the final program details have not yet been arranged by President Thomas S. Baker and his associates, representatives of Germany will participate prominently in the discussion of the use of pulverized fuel, gas production, liquefaction of coal, fixed nitrogen, low temperature distillation, tars and oils, boiler fuels and coal washing.

From preliminary indications, it is pointed out, Germany will have the largest delegation of speakers among the 18 foreign nations to be represented at the conference. France, England and Canada each will have comparatively large delegations. Other countries that will probably be represented by at least one speaker or delegate include Italy, Austria, Belgium, Chile, Cuba, Czecho-Slovakia, Denmark, Japan, Jugo-Slavia, Norway, Poland, Rumania, Russia and Spain.

Belgian Output Record

Brussels, Oct. 4.—(*European Staff Service*)—Iron and steel production in Belgium during August showed a substantial increase over the preceding months. Output of steel ingots and castings in August exceeded all previous records. It was composed of 332,270 tons of steel ingots and 9840 tons of steel castings. The output of rolled products in August also attained a record figure.

Output of pig iron in August was slightly under the maximum figures. The following table gives comparisons in metric tons:

Mon. ave	Coke	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	294,000	....	207,055	205,550	154,920
1925	342,645	....	211,875	212,380	151,215
1926	413,000	....	283,270	281,160	231,810
1927	448,880	....	312,620	309,040	255,185
1928					
Jan.	.....	55	314,580	315,650	277,870
Feb.	455,480	55	302,000	310,410	260,290
Mar.	495,330	55	326,720	326,480	277,070
Apr.	480,990	55	313,220	305,110	259,090
May	506,140	56	328,810	325,160	276,250
June	489,250	56	321,030	328,910	291,750
July	501,250	56	324,340	319,660	267,350
Aug.	504,710	56	328,590	342,110	293,180

Steam railway car exports from the United States in July totaled nine of which Canada received five, Mexico three, and Cuba one.

Cuba received 20 mine cars from the United States in July out of the total of 63 exported.

Strip

Mill Backlogs Hold and Deliveries Are Deferred Somewhat—Prices Being Held

SPECIFICATIONS for hot and cold rolled strip are about equal to shipments and mills continue to maintain good backlogs. Deliveries are about three weeks deferred in some cases. Buying further ahead is a result. Spot business is light in the face of general contracting and mills are asking current prices without weakening. Automotive needs continue large.

STRIP PRICES, PAGE 1010

Pittsburgh, Oct. 16.—Makers of hot rolled strips are able to maintain their backlogs, with current specifications practically equaling the rate of shipments. This has caused deliveries to be slightly deferred and consumers are anticipating needs more than in a year. Mills generally are asking three weeks as the best possible delivery promise. Little spot business is being received but mills are asking 2.20c for sizes under 3-inch, 2.10c on 3 to 6-inch, and 1.90c on 6 to 12-inch. Specifications are being applied on lower priced contracts, however. Spot business in cold strip steel is at 2.85c, with contract tonnages at 2.75c or 2.85c.

Worcester, Mass., Oct. 16.—The cold rolled strip steel price is much steadier. Listed widths are 3.00c and 3.10c, Worcester base, for volume business and the latter figure has been paid in some instances. Strip coming into New England is steady as to price.

New York, Oct. 16.—Demand for strip steel, both hot and cold, is not quite as active as in the corresponding portion of September. Nevertheless, demand is at a good rate and is expected to continue good, as indicated by the current rate of consumption. Prices are unchanged. Cold strip prices range from 2.75c to 2.85c, base, Pittsburgh. On hot rolled the usual price on 6 to 12 inches wide is 1.90c, base, Pittsburgh, although on attractive lots 1.85c continues. On less than 6 inches wide prices range from 2.00c to 2.20c, base, Pittsburgh, according to width and desirability.

Cleveland, Oct. 16.—Practically full operations among the cold strip makers, with but one or two exceptions, indicate specifications are numerous and for attractive tonnages. These come mainly from automotive customers. Several orders for single carloads up to 250 tons at a time are noted at 2.75c. Small orders command 2.85c. In connection with hot strips, where delivery dates are somewhat more attractive than in cold, an effort is being made to adopt a uniform base price of 2.00c, with a new card of extras. Some still retain three price levels. While some large buyers extended their third quarter price arrangements through the fourth quarter, spot market prices on these three classifications now are as high as 2.00c, 2.10c and 2.20c, respectively.

Youngstown, O., Oct. 16.—Two important makers of cold-rolled strip have advanced their minimum quotation $2 a ton, Pittsburgh or Cleveland, for 3 tons or more, to 2.85c.

Detroit, Oct. 16.—In instances hot and cold strip steel consumption, gaged by the specifications, is maintained uninterruptedly. Some automotive interests curtailed recently but others increased and the balance is well maintained. Quotations show increasing strength, for while many shipments of cold strips are billed at 2.75c, open market sales now carry a 2.85c minimum. In hot strips, prices occupy a wider latitude, each order being considered by itself, with blue annealed sheet as well as plate competition being taken into consideration in many instances. In a general way, however, 1.85c to 1.90c are named on wide hot strips; 1.95c to 2.00c on intermediate widths and 2.00c to 2.10c on narrow.

Cold Finished Steel

Specifications Hold Up Well at Firm Prices

COLD FINISHED PRICES, PAGE 1009

Pittsburgh, Oct. 16.—Little decline is noted in specifications for cold finished bars, several large automotive interests specifying against fourth quarter contracts. Although business placed during late third quarter was heavy, current buying indicates little material was carried over. Third quarter contracts did not expire until Sept. 30 and mills will make some shipments until the end of October against these contracts. Prices are firm at 2.20c, Pittsburgh, for cold finished steel bars, and 2.55c to 3.00c for turned and ground shafting.

Cleveland, Oct. 16.—While specifications on cold finished bars are a little lower than September, the fact that they continue to come after the heavy tonnages ordered late in September is encouraging to producers. It indicates an expanding consuming rate. This is marked in the automotive and allied industries. The price is firm at 2.25c, Cleveland.

Wire

Manufacturers' Wire Active but Jobbers Buy Sparingly—Market Shows Much Activity

MOST activity in the wire market is found in specifications and sales of manufacturers' wire. Mills are accumulating backlogs as a result. Jobbers find sales of nails and bright wire are slow and are not buying freely. Price resistance is less and the situation seems firm. October activity compares well with that of September. A first quarter price advance is rumored.

WIRE PRICES, PAGE 1010

Chicago, Oct. 16.—Sales of wire for manufacturing are above the September rate, and backlogs are piling up. Jobbers continue to buy sparingly because of overlapping stocks, particularly in nails and bright plain wire. Less opposition is reported to prices on the basis of 2.45c, Chicago or western mills, for bright plain wire, and $2.60 for wire nails.

Worcester, Mass., Oct. 16.—Fourth quarter specifications for steel wire and wire products show an increase. New orders are inclined to be limited in volume, but more numerous. Mill stocks are being lowered by the current buying. Prices remain steady at 2.55c, Worcester base, for plain wire.

Buffalo, Oct. 16.—Reports to wireworks are that this year's carryover of cloth and netting will be small, consequently midwinter stock orders of jobbers are expected to be good. Wireworks continue to operate at about 75 per cent although this is a dull season in some departments.

Cleveland, Oct. 16.—Wire nail demand continues to decline, this being the off season for consumption. A $2.50 price recently was uncovered by a buyer of 700 kegs. Despite these facts, however, a $2 advance may be announced next week in preparation for first quarter contracting. Wire specifications in different grades represent attractive tonnages and apply against fourth quarter contracts at 2.40c. The present nail price is $2.55.

Pittsburgh, Oct. 16.—Specifications for wire are well maintained, the October rate of buying comparing favorably with September. Automotive, chain and cable industries are specifying actively. Nails show a slight improvement, although they still lack the activity in wire. Prices are firm at 2.40c, Pittsburgh, for plain wire and $2.55 for wire nails.

Nonferrous Metals

Except for the Usual Fluctuations in Tin Prices Hold Unchanged—New Records Being Established in Copper Industry

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Oct. 10	15.25	15.32½	14.95	48.75	48.25	6.50	6.32½	6.25	23.90	11.25	35.00
Oct. 11	15.25	15.32½	14.95	48.37½	48.00	6.50	6.32½	6.25	23.90	11.15	35.00
Oct. 12	Holiday in New York										
Oct. 15	15.25	15.32½	14.95	48.62½	48.25	6.50	6.32½	6.25	23.90	11.12½	35.00
Oct. 16	15.25	15.32½	14.95	48.62½	48.37½	6.50	6.32½	6.25	23.90	11.12½	35.00

NEW YORK, Oct. 16.—The copper industry established additional new records in September. It appears certain the year will show a new tonnage figure, both in domestic use and total trade. Beyond strengthening previous convictions on the strength of the situation, however, the September figures have had no effect on the market.

All metals held steady during the past week, except for the usual fluctuations in tin. Buying of all metals, including copper, but excluding lead, was light. The latter was active and mostly for early shipment.

Current business reports all favor the metal markets, and especially the brass and copper products. Nearly all industries where the latter are finding large outlets, continue to operate well and enjoy a splendid outlook. Prices of mill products are unchanged on the basis of 15.25c, Connecticut, for copper.

Copper—Stocks of refined metal were cut nearly 3000 tons last month, while blister stocks increased slightly, with the result of a net cut in all stocks of about 1700 tons, to 307,434 tons, the lowest since the war. Refined stocks alone were 51,812. Shipments of refined metal in the month were practically 140,000 tons, slightly less than in August but higher on a daily basis. Of this total 88,707 tons were for domestic users, the greatest amount shipped in one month.

Both domestic and export totals for nine months are ahead of the respective totals for any corresponding period in the past. Outstanding in the business this year is the increase in shipments to domestic copper sheet mills. Mine and smelter outputs last month again were increased slightly, but the decrease in total stocks makes new records in mine and smelter output necessary. Users are well covered for the rest of the year, but a little new business has been going, while export sales, not booked so well ahead, have been fairly active.

Tin—The price has fallen a little farther in the past week, but firmed up on Monday. Buying on most days was extremely light. Trade opinion in this country has been mostly on the bearish side, but opinions have not been strong enough to cause much actual market operation in that direction.

Lead—The market continues active and prices are firm but unchanged. Use appears to be larger than earlier in the year and there is a general tone of confidence in the market.

Zinc—The market continues quiet but the price on prime western is steady. Business is done in a quiet routine way and the market does not get up the enthusiasm shown in other metals. This is natural with the recent increase in stocks to the highest in many months. This month output probably will be lower and shipments are said by smelters to have increased.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	19.75
Copper, hot rolled	24.00
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	9.75
Zinc strip (100 pound base)	9.00
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	24.62½
Copper	25.50
RODS	
Yellow brass (high, full turnings)	17.50
Naval brass	20.25
WIRE	
Copper, car lots	16.87½
Yellow brass (high)	20.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.75 to 10.00
Chicago	9.75 to 10.00
Cleveland	9.50 to 10.00
HEAVY YELLOW BRASS	
Chicago	7.00 to 7.25
Cleveland	7.75 to 8.00
ZINC	
New York	3.50
Cleveland	3.25
HEAVY COPPER AND WIRE	
New York	12.50
Boston	11.50 to 12.00
Chicago	11.50 to 12.00
Cleveland	12.50 to 12.75
RED BRASS BORINGS	
New York	8.75 to 9.00
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.50
LIGHT COPPER	
New York	11.00
Chicago	10.25 to 10.50
Cleveland	11.25
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.25 to 6.75
Cleveland	6.00 to 6.25
ALUMINUM	
Clippings, Cleveland	17.50 to 18.00
Borings, Cleveland	8.50 to 9.00
Cast, Cleveland	12.50
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt Aluminum No. 12	15.50 to 16.00
Brass ingot, 85-5-5	13.00

Coke By-Products

Benzol Deliveries Fall Behind—Toluol Sold Until Dec. 1

New York, Oct. 16.—Heavy demand for benzol continues, with the likelihood present shipments of around three weeks from producing plants will be extended. Prices manifest a buoyant tendency, although 22 to 23 cents, works, still prevails for pure and 90 per cent benzols in tank lots and 27 to 28 cents in drums.

Leading sellers of toluol are booked up on their production until about Dec. 1. Prices on toluol, however, are unchanged. Scarcity of this product continues to simulate demand for commercial xylol, which, with solvent naphtha, is holding at 30 cents, works, in tank lots and 40 cents in drums.

Spot sulphate of ammonia for domestic account is holding at $2.30 delivered and for export at nominally $2.35, port, for material in double bags. Demand is quiet. However, due to heavy commitments on back contracts there is no large accumulation of supplies. Naphthalene is seasonally dull.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.22 to 0.23
90 per cent benzol	0.22 to 0.23
Toluol (nominal)	0.35
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.06 to 0.07
Naphthalene balls	0.06 to 0.07
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.30

Sheet Piling is Placed

Pittsburgh, Oct. 16.—A Pittsburgh producer has booked 350 tons of sheet piling for a reservoir at Mineral Ridge, O. Bids on 3000 tons for a Mississippi river dam for federal engineers have been referred to Washington.

Warehouse

Consumers Await Mill Deliveries, Turn to Jobbers—Swedish Iron Prices Reduced—October Tonnage Betters September's

NUMEROUS buyers of steel, finding deliveries on their mill orders post-dated, are turning to jobbers. October tonnage of jobbers in many sections therefore is well ahead of September. The Philadelphia report last week was erroneous in calling attention to the fact that the regular warehouse cash discount is for cash within 15 days. The item should have stated "by the 15th proximo."

New York—While the holiday, Oct. 12, cut in somewhat on the volume, local warehouses have been active. Brisk trading for two to three weeks makes sellers expect October substantially to exceed September. Only in sheets do any price irregularities appear. Prices on foreign steel out of warehouse are featured by reductions in Swedish iron and steel, hollow drill steel now holding at 13.00c, duty paid, and iron bar rounds at 6.10c. Iron bar flats and squares are now 6.50c, duty paid.

Pittsburgh—Steel is moving out of warehouses at about the September rate. Tonnage is at the usual high seasonal level. Sheets have slightly overshadowed other products although bars and building construction material move well. No. 24 gage galvanized sheets generally command 4.40c although some shading of this figure occasionally is heard. Jobbers are passing on the mill reduction in cash discount.

Cleveland—Diversified demand is enjoyed by jobbers with tonnage so far this month well ahead of the same September period. Prices all are firm. Blue annealed sheets did not advance recently with black and galvanized and are still 3.25c.

Detroit—Principal products being sold out of warehouse here are bars, hoops and bands and sheets. October sales are 10 per cent heavier to date than in September. Prices are firmly held and no discrepancies are reported in new cash discount terms.

Cincinnati—Warehouse managers report that tonnage is satisfactory since some mills have closed their books for the year and buyers go to warehouses for their needs. Numerous small structural shape and wire and nail orders are noted. Prices are firm.

St. Louis—Improvement of recent weeks continues. Some lines exhibit more than the customary seasonal betterment. Sheet demand is strong, stimulated by delayed mill deliveries. Hoop, band and tie sales to the South are large. Wire fencing orders are good. Railroad and automobile shops, coal mines all are heavy buyers.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles	3.30c
New York †††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	2.50c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.50c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 3.00c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.80c to 3.24c
Philadelphia	2.85c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	2.90c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Phila., 3/16-in.*	2.90c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia *†	3.00c
Pittsburgh**	3.00c to 3.10c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.54c

NO 24 BLACK SHEETS

Baltimore	3.10c to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.50c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York††	3.70c to 3.80c
Philadelphia*†	3.85c
Pittsburgh‡	3.50c to 3.55c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.10c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.10c to 4.75c
Boston	5.85c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.35c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York†††	4.25c to 4.50c
Philadelphia*†	4.60c
Pittsburgh‡	4.40c
Portland	5.50c
San Francisco	5.40c
Seattle	5.50c
St. Louis	4.95c
St. Paul	4.90c
Tulsa	6.50c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	4.00c
Philadelphia*	3.35c
Pittsburgh	3.60c
Portland	3.75c
San Francisco	4.10c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.50c to 4.66c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.25c
Cleveland	3.65c
Detroit	4.15c
New York‡‡	4.50c
Philadelphia*	3.60c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.45c	3.95c
Pittsburgh	3.60c	4.10c
Portland (a)	4.75c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.76c	5.26c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, rounds	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles. †††Newark-Jersey City 4.00c on black and 4.70c on galvanized the more prevalent figures.

Pacific Coast

Buying of Shapes Active—Oil Storage Tanks Take Additional Tonnage of Plates

IRON and steel buying on the Pacific coast continues active, with structural steel buying most in evidence. Additional building projects promise further demand for shapes. Oil companies continue to place storage tanks, 2000 tons of plates being sold for this purpose the past week. A large power station at Seattle will require much steel.

San Francisco, Oct. 13.—(*By Air Mail*)—Trading in iron and steel products on the Pacific coast continues well maintained and a number of new projects, involving fair sized tonnages, have recently come out for figures. Structural steel shapes were especially active, more than 4600 tons being placed during the week. These projects include 2500 tons for the new tin plate mill for the Colombia Steel Corp., Pittsburgh, Calif., 2000 tons for a power house for the Great Western Power Co. at San Francisco, and 2000 tons of plate material for oil storage tanks for the General Petroleum Corp. at Los Angeles.

Pig Iron and Coke

Movement of foundry pig iron and coke has shown little improvement during the past month, sales and inquiries being limited to small lots for prompt shipment. A shipment of 1400 tons of Indian iron recently arrived on the Coast and another lot of several thousand tons is due about Dec. 1. During the past week one importer brought in approximately 5000 tons of English beehive and by-product coke, applied against contracts placed some time ago by melters in Los Angeles and San Francisco districts. English by-product coke is quoted at $11.50 to $13 a net ton, delivered incoming dock, while beehive coke is quoted around $16 a net ton. Foundry pig iron quotations remain unchanged.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

Bars, Plates and Shapes

During the past week concrete bar awards totaled over 900 tons and brought the aggregate for the year to 70,992 tons, compared with 45,954 tons for the corresponding period in 1927. Most awards involved lots of less than 100 tons, the Pacific Coast Steel Co. securing the only award of over 100 tons, which called for 575 tons for army buildings at Fort Lewis, Wash. Pending business involves close to 10,000 tons. Bids were opened this week on 1800 tons for a college building at Berkeley and on 675 for a building for Sears, Roebuck & Co. in San Francisco.

The largest plate award involved 2000 tons for five 134,000-barrel tanks for the General Petroleum Corp., placed with Riter-Conley Co. through McClintic-Marshall Co. Bids were opened this week on a pipe line at Hood River, Oreg., calling for 1200 tons of material. Awards so far this year aggregate 31,642 tons, as compared with 54,619 tons for the same period last year. Important pending projects include 3100 tons for ten 80,000-barrel tanks for the Shell Oil Co., Los Angeles, and 231 tons for a 24-inch riveted cast iron pipe line at Seattle. A tendency toward higher prices is noted, though current quotations continue at 2.20c to 2.25c, c.i.f.

Structural shape awards for the week were the third heaviest of the year and totaled 7580 tons. Dyer Bros. secured 2000 tons for a power plant in San Francisco, 300 tons for an open-hearth furnace and 150 tons for a machine shop for the Colombia Steel Co., at Pittsburgh. The new tin plate mill for Columbia Steel Corp., involving 2500 tons, went to McClintic-Marshall Co. Pending business is of fair proportions. On plain material, prices remain firm at 2.35c, c.i.f.

Other Finished Material

Trading in cast iron pipe is by no means active and few awards or new inquiries were noted during the week. Los Angeles placed 1266 tons as follows: 844 tons to R. D. Wood & Co. and 422 tons with the Pacific States Cast Iron Pipe Co. Bids were opened this week on 164 tons for Phoenix, Ariz. The largest pending project calls for 1284 tons for Seattle, bids on which open Oct. 26. Steel pipe mill representatives are keenly interested in the formation of the Northern California Gas Co., a company organized by the Pacific Lighting Co., the Southern California Gas Co. and the Pacific Gas & Electric Co. for the purpose of constructing a 210-mile gas pipe line from Ventura to the San Francisco district. Approximately 50,000 tons of pipe will be used.

Seattle Trade Slower

Seattle, Oct. 11.—Increased activity in the foundry industry, spotty trade among wholesalers, steady prices and generally hopeful sentiment characterize the iron and steel trade in the Pacific northwest.

While at the moment inquiry for iron and steel is not heavy, several important construction and building projects are proposed. The largest of these is a steam generating power plant on Lake Washington adjacent to Seattle by the Puget Sound Power & Light Co. The first unit will be built at once. It will be 50,000 horsepower. This plant is planned ultimately to develop 210,000 horsepower and to cost $5,000,000. The power will be used in supplementing present power units operated by the same company in this section. Stone & Webster have the contract for the construction.

Pig Iron and Coke

Interest in iron is confined to Burn and Columbia. Orders totaling 200 tons for Burn have been placed during the week, this iron being quoted at $25.25, which is 25 cents higher than last month. Delivery is to be made in December. For quick shipment No. 1 Columbia, silicon content 2.75 and up, is being sold at $26 and $26.50, while No. 2, 2.25 to 2.75 silicon, is selling for $24. While Columbia is being bought in small tonnages, several local plants have their requirements covered for the first half of 1929. Coke is unchanged, Tyneside at $13.25 and Victoria at $13.50.

Bars, Plates and Shapes

Although local mills report unchanged operations, there is less inquiry for merchant and reinforcing bars, due to slacking of construction. Mill prices of merchant bars are steady at 2.35c and reinforcing at 2.20c. Concrete awards are in small tonnages, Northwest Steel Rolling Mills having booked 100 tons for the Hoquiam city hall and state highway work. Bids will be opened Oct. 16 for the Veterans' hospital at Walla Walla, Wash., involving 100 tons of reinforcing. Construction is reported active at Vancouver, B. C., several large jobs pending, including a hotel and a medical and dental office building.

Mill representatives report limited inquiry for plates and shapes but prices are steady, plates 2.25c and structural 2.35c. The only contract awarded this week involved 230 tons for the Beebe Orchard Co., Wenatchee, Wash., for an 18-inch irrigation pipe line. The general contract at $50,000 went to the Goodfellow Bros., while the pipe job was taken by Beall Pipe & Tank Co., Portland, Oreg. Bids were opened yesterday for the Hood River, Oreg., city water project, involving 1200 tons but the figures are not yet segregated.

Finished Materials

The wholesale jobbing business is below expectations this month and is not on a par with September.

Contracts totaling about 300 tons for the city of Seattle were booked this week by the office of Hugh G. Purcell for the United States Cast Iron Pipe & Foundry Co. Award will be made this week for 1000 tons or more for Edmonds, Wash. Cast iron pipe agencies here are figuring closely on 1640 tons for the Volunteer Park water extension, Seattle, which will go either steel or cast iron.

September Exports Up; Imports Down

Washington, Oct. 16.—The value of exports increased and imports decreased in September compared with the same month of last year, according to the department of commerce.

In September the value of exports was $426,000,000, compared with $425,267,000 in the same month of last year, while imports in September were valued at $321,000,000 compared with $342,154,000 in September of last year. This year the excess of the value of exports over imports for September was $165,000,000, compared with $83,113,000 in September of last year.

For the nine months ending September the value of exports was $3,562,725,000, compared with $3,508,120,000 during the same period of last year. Imports for the nine months ending September were valued at $3,071,576,000, against $3,153,502,000 for the same nine months period ending September, 1927. The excess of the value of exports over imports for the nine months ending September this year was $491,149,000 compared with $354,618,000 for the same period of 1927.

Australian Plant Plans Big Expansion

Washington, Oct. 16.—One of the largest units in Australia's iron and steel and nonferrous mining and metallurgical industries has announced plans for the development and expansion of its steel works at Newcastle, this expansion to have an initial cost of £1,000,000, Trade Commissioner E. C. Squire, Sydney, informs the department of commerce.

At the moment this expansion will be confined to the erection of a battery of coke ovens and a by-product plant, the equipment to be of the Coppee type and supplied by the British company bearing that name, the company declares. It is understood that the Coppee company intends to use the largest possible proportion of Australian material and workmen in the construction of the new plant, importing from England only those special materials and skilled technicians not obtainable locally. As there is now much unemployment in the Newcastle district owing to the situation in the local coal fields, the construction of the plant, which will take several years and require the services of a number of men, is looked upon with special favor.

In some quarters this expansion is taken to indicate the inauguration of a plan to meet competition.

Seeks Rate Reduction

Washington, Oct. 16.—The Morse, Rogers Steel Co. of Cleveland, has filed a complaint against the New York Central railroad with the interstate commerce commission in which it asks the commission to prescribe the same rates on damaged or defective sheet iron or steel, waster plates or sheets and other commodities as apply to billets or scrap iron from various points of origin in western New York, Pennsylvania, Ohio, West Virginia, Kentucky and Maryland to New York city and group. Reparation is claimed.

Structurals Pending

(*Concluded from Page* 1019)

Highway, Brooklyn, N. Y.
243 tons, Gardiner bridge, Yellowstone river, Montana. Bids opened at Portland, Oreg.; Illinois Steel Bridge Co. low bidder.
200 tons, electrification projects, Union Terminals Co., Cleveland; bids in.
180 tons, Cincinnati pike bridge, Montgomery county, Ohio; bids in.
170 tons, Jackson Creek spillway, East Bay municipal utility district, Oakland, Calif. General contract to Ward Engineering Co. Shapes not yet awarded.
100 tons, 3-story service, repair and garage building, Marmon-Detroit Co., Detroit; plans being prepared.
100 tons, plant building, Stinson Aircraft Corp., Northville, Mich.; planned for early construction.
100 tons, Toms river bridge, New Jersey state highway department, route 4, section 16-A; bids Oct. 22.
Unstated tonnage, court house, Stapleton, Staten island, N. Y.
Unstated tonnage, hospital, Princess Bay, Staten island, N. Y.
Unstated tonnage, 15-story bank and office building, Kalamazoo Trust & Banking Co., Kalamazoo, Mich.; bids about to be asked.
Unstated tonnage, addition United States post office, Newton, Kans.; bids close Oct. 22 at treasury department, Washington.
Unstated tonnage, post office, Olyphant, Pa.; bids close Nov. 2 at treasury department, Washington.
Unstated tonnage, post office, Wyandotte, Mich.; bids close Nov. 12 at treasury department, Washington.
Unstated tonnage, addition to court office, Santa Fe, New Mex. Bids close Nov. 23 at treasury department, Washington.
Unstated tonnage, convention hall, boardwalk arcade and theater, Asbury Park, N. J.; general contract to Turner Construction Co.
Unstated tonnages, subway sections 5 and 6, route 106, New York; plans being prepared for issuance in few weeks.
Unstated tonnage, 15 toll bridges for Alabama. Bids to be opened Nov. 27. Bids will be opened Dec. 1 for sale of $5,000,000 in bonds to defray construction expense.
Unstated tonnage, 3-story laboratory building, Bell Telephone Laboratories Inc., Bank street near Washington street, New York; general contract to Turner Construction Co.
Unstated tonnage, southwestern approach to St. Louis municipal free bridge; general contract to Frazier Davis Construction Co., St. Louis on its bid of $152,000.
Unstated tonnage, building contemplated for Chrysler Corp. of Canada on a 70-acre site between Ford and Walkerville, Ont; plans about to be prepared.
Unstated tonnage, building at Oakland, Calif., for Chrysler Corp., Detroit; bids probably will be taken at Detroit for Western fabrication.

Pig Iron Is Strengthening

(*Concluded from Page* 1011)

for drop forgings on a 4-cylinder car now on the market will create additional tonnage. In the meantime, aggregate tonnage for a day or a week is considerably ahead of a year ago, although buyers continue their hand-to-mouth policy of ordering. Recent sales have been at $18.50, lake furnace, for No. 2 and malleable.

Cincinnati, Oct. 16.—An Evansville, Ind., manufacturer closed late last week for 500 tons of northern foundry and 500 tons of southern foundry, for delivery in November, December and January. Two 300-ton lots of standard slivery iron were sold in Michigan. Inquiries for northern foundry iron total 2000 tons. Prices are steady.

Chicago, Oct. 16.—Pig iron shipments to melters tributary to the Chicago district merchant furnaces are heavy, but furnaces feel easier as regards stocks. With the blowing in of the two additional South Chicago merchant furnaces, a better balance of grades and analyses has been obtained. Indications are that shipments this month will exceed the September volume by 10 to 15 per cent. Some melters are adding to their original contracts. Southern iron sales are lighter in territory ordinarily served by Chicago furnaces. Malleable melters marketing castings to the automotive industry hear the Ford interests of Canada now are using 40 pounds of malleable castings to each new Ford car. The price of $18.50, base, Chicago furnace, is steady for spot and contract business.

Silvery prices are firmer in spot sales, but large users have covered for the year.

St. Louis, Oct. 16.—Insistent demands for deliveries of pig iron and a good volume of fill-in buying are the chief features of the market. Several leading consumers have made tentative inquiries, and are expected to close soon on their entire fourth quarter requirements. The melt has been gaining steadily during the past several weeks. According to the leading local producer of pig iron, October shipments will be the largest for any month this year, and within a few tons of its record month. Southern blast furnaces have been shipping heavily into this area. Sales reported during the past week total about 5000 tons. There were some sales of charcoal iron, mainly to southern users, and demand for silvery iron is fair. Prices continue strong.

Birmingham, Ala., Oct. 16.—While there is no great activity in the pig iron market, small consumers are buying one to three carloads at a time and the output is being absorbed. Shipments are steady. Nineteen blast furnaces are in operation in Alabama, 11 on foundry iron. The two new furnaces of the Tennessee Coal, Iron & Railroad Co., at Fairfield, are producing around 1200 tons of basic iron daily. Large melters have purchased liberally for fourth quarter.

Toronto, Ont., Oct. 16.—Spot pig iron sales continue in good volume. Advance buying is slow, with only two or three contracts for last quarter delivery, in lots under 500 tons, reported for the past week. The movement of foundry and malleable iron to consumers is in record volume. Prices are firm.

United States exported 10 electric railway cars in July, all of which were taken by Germany.

Institute Will Evolve Code of Ethics

A new program for the fabricated steel industry is to be considered by the American Institute of Steel Construction at its annual convention to be held at Biloxi, Miss., Nov. 13-17. During the past four years attention has been concentrated largely upon technical problems and engineering standards. The new program will embrace problems of buying and selling, out of which it is expected to evolve a code of ethics or trade practices.

To introduce the subject in its broad scope, the institute has scheduled three particular addresses. The buyer's attitude as related to the present competitive conditions among sellers will be discussed by L. F. Boffey, editor of *The Purchasing Agent;* and the character of salesmanship essential to meet present-day economic conditions will be discussed by C. K. Woodbridge, president of the Kelvinator Corp., Detroit, and past president of the International Advertising association. Following these, Abram F. Myers, commissioner of the Federal Trade commission, will address the convention on the powers and duties of trade associations. These three addresses will constitute a symposium of the business problems of the industry.

Will Talk on Gray Iron

An address entitled, "Gray Iron: An Engineering Material," will be presented by J. W. Bolton, metallurgical engineer, Lunkenheimer Co., Cincinnati, before the Newark Foundrymen's association, Downtown club, Newark, N. J., in the evening of Oct. 24.

Active in Missouri Ore

St. Louis, Oct. 16.—The Missouri Ore Co., of Iron Mountain, St. Francis county, Mo., is asking for bids on new buildings consisting of residences for foreman and laborers, a brick office building, warehouse, etc. The present force of workmen is to be increased one-third for the expansion of mining operations. Diamond drilling is said to have revealed the presence of substantial bodies of rich deep iron ore.

Car Needs Are Higher

Chicago, Oct. 16.—The midwest shippers' advisory board estimates that 7 per cent more freight cars will be required to handle business in midwest territory in the last quarter of 1928 than in the same period of 1927. Increases of 10 per cent are forecast in shipments of cement, iron and steel. For coal and coke the expected increase is 7 per cent and for castings, machinery and boilers 5 per cent.

New Shipbuilding Firm is Formed

New York, Oct. 16.—American Brown Boveri Electric Corp. has separated its electric and shipbuilding activities by organizing the New York Shipbuilding Co. as a subsdiary, leasing to the new company the shipbuilding facilities at Camden, N. J. The new company will take over and complete all existing ship contracts from the parent company and will continue permanently in the shipbuilding business. W. M. Floock is chairman of the board of the New York Shipbuilding Co. and other officers are: President, C. L. Bardo; vice president and treasurer, J. E. Slater; vice president and general manager, E. I. Cornbrooke; naval architect, E. H. Rigg; controller, Norman H. Parker, and secretary, A. G. Connell.

Tractor Shipments Up

Washington, Oct. 16.—Shipments of electric industrial trucks and tractors in September made a comfortable gain over August, according to the department of commerce. Monthly comparisons follow:

		Domestic All other	
1927	Tractors	Types	Exports
September	8	66	5
Total, 9 mos.	101	772	83
October	11	81	17
Nov.	15	64	19
Dec.	8	77	11
1927 Total	135	994	130
1928			
January	5	98	9
February	15	86	18
March	18	*95	16
April	9	*121	6
May	8	*93	13
June	6	*96	14
July	5	87	15
August	5	85	6
September	11	102	5
Total 9 mos.	82	863	102

*Revised.

Coal Production Drags

Production of bituminous coal in the week ended Oct. 6 was 11,028,000 net tons, compared with 11,056,000 tons in the preceding week and 10,286,000 tons in the comparable week of 1927, states the federal bureau of mines. For the calendar year to date 364,002,000 tons of bituminous coal has been mined, against 403,157,000 tons a year ago.

Beehive coke production in the week ended Oct. 6 totaled 82,000 net tons, bringing the year's total up to 3,226,000 tons. By this time last year 5,926,000 tons had been made.

Oil Company Buyers Will Talk Valve Markings

The oil company buyers' group of the National Association of Purchasing Agents will hold a session in Tulsa, Okla., Oct. 23, during the international petroleum exposition which runs from Oct. 20 to Oct. 29. One of the subjects scheduled for discussion by the group is the proper marking of valves and fittings for oil country use, and the possibility of standard specifications for these items. Emory A. Cook, purchasing agent of the Twin State Oil Co., Tulsa, is chairman of the group and will preside at the meeting.

Sees Tin Plate Growth

New York, Oct. 16.—Although this year's production of tin plate in the United States has surpassed its record by 10 per cent, this growth is bound to continue, according to E. R. Crawford, president, McKeesport Tin Plate Co., McKeesport, Pa. Tin plate is being constantly turned to new uses, declares Mr. Crawford, and for its principal use, that in the canning industry, it is claimed to have no rival.

Can Use Coarser Mesh in Flotation Process

It has generally been held that for the treatment of ores by the flotation process, crushing to minus 65 mesh is required. This was the size limit of grains which experience seemed to indicate, when oils chiefly were used. Experimental work at the Moscow field office of the United States bureau of mines, department of commerce, shows that sands crushed to not nearly this degree of fineness can be readily floated. In some of the work at that station, as coarse as 20 mesh sands are amenable to flotation. Even coarser sands that expose at their surfaces very small specks of the flotable mineral may be lifted.

This broadening of the field of flotation is due to the development in recent years of the "promoter" class of reagents. These substances so greatly increase the flotative vigor of a mineral that correspondingly larger grains may be lifted. Flotation is rapidly expanding into the size range of table concentration and the cost of crushing for flotation gradually being reduced.

Whelco Engineering & Mfg. Co., Chicago, has increased its capital from $25,000 to $50,000. McElroy, Rollo, Ehrhardt & Quigley, 29 South LaSalle street, are correspondents.

Implement Makers Can Assist Largely in Solving Farm Problem

Farm Equipment Manufacturers Consider Means in Annual Convention—Replacement Needs Assure Large Production

AMPLE opportunity exists for a steady expansion in sales of farm equipment, both in the domestic and foreign markets, it was pointed out in reports presented at the thirty-fifth annual convention of the National Association of Farm Equipment Manufacturers, in the Nicollet hotel, Minneapolis, Oct. 10-12. Indications are that this year will be a record in farm machinery and tractor production and sales, and reports showed that the farm implement industry is in a healthy state. Stocks have been reduced in warehouses in all sections and the outlook for buying next spring is encouraging.

It was pointed out that new and revolutionary types of farm equipment are in the process of development and design by agricultural engineers. That an amazing total of business for the farm equipment industry should be in sight over the next few years was pointed out in the discussions.

Discussing "Our Industry," V. A. Stibolt, vice president of the Rock Island Plow Co., Rock Island, Ill., stated that:

"It may not be adverse to call attention to some general facts as to the business available. While the economic life of farm equipment is more or less a matter of debate, some authorities using ten years as the average life, which takes into consideration both wear and obsolescence in type, there is a potential yearly replacement market for farm equipment in this country of between $300,000,000 and $400,000,000. This does not take into consideration the purchases which may be expected in adding necessary equipment due to obvious obsolescence which has taken place during the farm depression of the past decade. I should like to quote a recent survey in this connection:

"'The value of all farm equipment in the United States, as determined in the 1925 census, was $3,594,000,000. This is at the rate of $7.15 an acre for improved lands. Without taking into consideration any of the obvious factors, such as the tremendous volume of outdated, obsolete and worn-out machinery now on farms, something more than $1,500,000,000 of farm equipment is required to bring farming to a modern efficient basis. If allowance is made for replacement of obsolete or worn-out equipment at the rate of 10 per cent annually on total inventory, or $360,000,000 a year, and for the greater needs per acre of smaller farms specializing in crops other than the ten major crops, it will be seen that a staggering total of business should be in sight over the next few years.

"'It is widely supposed that the modern farmer buys new or improved machinery only when he is prosperous. This is a fallacy. The records of the past few years show conclusively that he also buys when his returns are lowest, because he then realizes most keenly that machinery and modern methods are necessary to help earn a profit. In days of prosperity it is easier, of course, to sell him a new idea in machinery, and his general purchases are larger.'"

Mr. Stibolt pointed out that the mechanical horsepower used per farm worker has more than doubled in the past decade. He said:

"Based on figures available in 1925 there were 4.5 horsepower in mechanical equipment available to every farm worker. Since 1925 the number of combined harvester-threshers in use on American farms has trebled, and the number of tractors in use has increased at least 33 1/3 per cent, so, were figures available today, no doubt we would find that the ratio of mechanical horsepower to man power would be considerably higher.

"The Association of Farm Equipment Manufacturers is now engaged in promoting a campaign among rural bankers, urging upon them their consideration of sympathetic financial assistance to the dealer in order to promote the sale of necessary farm equipment in his community," he said. "It is an unquestioned fact that successful farming is necessary to successful banking in our rural communities, but under today's complex merchandising structure, and the growing necessity to finance installment sales, it seems to be equally true that necessary equipment will make but slow progress unless supported by sympathetic interest on the part of bankers."

Mr. Stibolt suggested that the most substantial foundation for future prosperity of the western farm lies in the development of the consumer market on the threshold of the farm area, and that the keynote of the development of this consumer market is the industrial expansion of the Middle West.

The extent to which the farm implement industry can co-operate with the farmer in relieving distressing farm problems was emphasized by Roy Johnson, Casselton, N. Dak., who operates 920 acres of land and who last year was chosen one of the master farmers of his state, in declaring that the reduction in costs of producing farm commodities lies partly in the hands of the builder of farm machinery. He urged co-operation with farmers and experiment stations in furnishing information to the farm buyer as to the best sizes and types.

"The purchase of unadapted or unsuitable machinery," he said, "is a loss to a farmer which may prevent him from obtaining other needed equipment that will increase his profits.

"The farm equipment manufacturer should be particularly interested in the development of diversified farming for two reasons. In the first place a more stabilized and certain farm income would increase the farmer's buying power, and in the second place a diversified program would require a greater variety of farm equipment."

Announcement was made that another national farm equipment week, for a nation-wide display and exposition of farm implements and machinery, will be held Feb. 18 to 23, 1929, when newest models and designs of farm machinery will be displayed.

Resolutions reaffirmed the interdependence of agriculture and the farm implement industry, and urged renewed efforts to discourage further prison production of farm equipment. The association also went on record to oppose increase of railroad freight rates in the distribution of farm equipment. It was urged also that the earliest possible action be obtained in developing the Great Lakes-St. Lawrence waterway project, to furnish a direct outlet for the products of the Mississippi valley.

Officers Elected

President

JOHN C. MYERS,
F. E. Myers & Bro. Co., Ashland, O.

Executive Chairman,

A. E. MCKINSTRY,
International Harvester Co., Chicago

Executive Committee,

Three years: A. E. McKinstry; M. A. Steele, president, Stover Mfg. & Engine Co., Freeport, Ill.; George White, vice president, Massey-Harris Co., Racine, Wis.; Walter A. Weed, general manager, Oliver Chilled Plow Works, South Bend, Ind.; one year term: V. A. Stibolt, executive vice president, Rock Island Plow Co., Rock Island, Ill.

American Foreign Trade Analyzed

Bulk of Iron and Steel Exports Goes to Non-European Countries; Great Expansion in Scrap Shipments Is Noteworthy

By Luther Becker

EASILY the ranking producer of steel in the world today, the United States stands fifth on the list of those nations purveying to the needs of the steel consuming markets of the world, being exceeded by France, Germany, Great Britain and Belgium and Luxemburg in the order named. Of these, France, the greatest distributor of steel today, sold 2,300,000 tons of ferrous products in foreign markets from January through June of this year, Germany and Great Britain each but 150,000 tons less, and Belgium and Luxemburg together slightly less than 2,000,000 tons—the United States trade over this period totaling 1,350,000 tons with export sales increasing.

These figures do not present quite the true picture of this relationship, however, for whereas virtually all of the exports of the United States go to non-European areas a good part if not the bulk of the sales of those countries which exceed the United States in exports are between themselves—Belgium supplying sheet bars to Great Britain and receiving finished black and galvanized sheets in return, and so on. Further, these figures do not serve to reveal the tremendous pressure which extensive excess capacity brings to bear on the European steelmaker and which make export sale of his steel a vital necessity. It is not exaggerating to say that France must export between 40 and 60 per cent of her output in order to effectively and economically utilize her present capacity. Germany and Great Britain from 20 to 35 per cent, and Belgium and Luxemburg 60 to 75.

It has been estimated that approximately 98,000,000 tons of steel ingots and castings was made throughout the world during 1927. Of this tonnage 45,000,000 tons was made in the United States—a quantity amounting to 46 per cent of the total. Germany, the next largest producer outside the United States, is accredited with little more than one-third this tonnage (16,000,000 tons), Great Britain with one-fifth as much (9,000,000 tons), France with something more than a sixth (8,000,000 tons), and Belgium and Luxemburg with a ninth (5,000,000 tons) as much between them.

In the second rank there is the Saar, with a 1927 output of nearly 2,000,000 tons, Italy, Czechoslovakia and Japan, with about 1,600,000 tons each, Poland with 1,250,000 tons, and Canada with 915,000 tons.

Tin Plate Ranks High

With one exception tin plate is the principal iron and steel product exported by the United States—the trade in 1927 having totaled 254,000 tons. Here again, although not the principal factor in the world trade, the United States is the producer of the greatest tonnage, our exports being inferior in tonnage to those of our only competitor of moment, Great Britain. Being without such colonial markets as Great Britain enjoys in India, Australia, and South Africa, the United States nevertheless sells tin plate in virtually every country of the world.

American rails found almost as wide employment in foreign lands, the 178,000 tons exported last year having been laid down at points as widely separate as Belgium and Mozambique and Canada and Uruguay. American rails grooved for street railway use carry the street cars of Spain, light rails climb the slopes of the Chilean Andes linking mines with seaports, and heavy rails have gone into Manchuria aiding in the development and industrialization in progress there under Japanese direction. The bulk of our trade, however, was with Japan proper and with Brazil although Canadian and Cuban purchases aided mightily.

Black and galvanized sheets are two other leading items in our export trade—export sales of each having aggregated approximately 150,000 tons last year. Galvanized sheets, however, find rather the wider usage than do the black steel, the markets for the latter being more frequently those in which galvanizing plants were already set up. American galvanized sheets were imported during 1927 into Iceland, and although not braving the blasts from Greenland's icy mountains they did feel the torrid heat of India's coral strand. They sheltered blacks in the Congo and Liberia, yellow men of China and Mongolia, brown men of Malaya and the East Indies, as well as whites throughout Europe, America, and South Africa. They sold best, or in largest tonnages, in Canada, the Philippine islands, and Cuba. Black sheets went rather to Canada and Japan to be galvanized there.

The foregoing is largely descriptive of the more usual activity of this country in export markets, leaving for the close the most outstanding development in the year's trade—the tremendously increased exportation of scrap. This activity, which monthly is setting new levels in point of tonnage shipped, is of quite recent origin, the first distinct manifestation of any unusual activity being that when the scrap trade took its first distinctly upward turn in March, 1927. Since that date shipments have increased by leaps and bounds, the largest single month's activity being that of last August when a total of 70,538 tons were shipped abroad—the record tonnage for all time.

Over the 18 months which have elopsed since this activity may first be considered to have started a total of 592,051 tons of scrap have left this country destined for consumption in foreign furnaces—364,776 tons having been shipped in 1928 alone. Principally this scrap has gone to Canada, Japan, Italy, Poland, and Germany—all, with the exception of the first named, being countries whose supply of iron ore is inadequate to local demands and which must needs use large tonnages of scrap in their furnace charges.

The author is chief of the division of iron and steel, bureau of foreign and domestic commerce, Washington.

Metallography Simplified

(*Concluded from Page* 992)

moving the microscope. The evaluation of the ocular micrometers for different objectives is accomplished by a scale put in the place of the sample. This scale is subdivided in 1/10 of a millimeter. The number of scale divisions of the ocular micrometer included in one division of the object scale is observed. If this is subdivided in 1/100 of a millimeter, then one division of the ocular scale corresponds to 1/100 millimeter object size. If the magnification of the optical accessories has been determined these values are noted with the particular tube length used. Each tube length has its own values.

British Mills Book More Orders

Demands for Structurals, Track Material and Galvanized Sheets Show Expansion—
September Steel Production Increases, Pig Iron Output Reduced—
German Exports Gain—Continental Hoopmakers Organize

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Oct. 16.—Demand for constructional steel at Middlesbrough is improving. Among contracts booked there recently is one calling for a bridge in Malaya. A Darleston firm has obtained an order for substantial tonnage of track material for delivery to South Africa. Staffordshire strip trade is improving owing to demands for automobile stampings and requirements for tube mills. The market for boiler plate and skelp is active. Sales of Middlesbrough hematite are steady. Another blast furnace in Derbyshire is resuming operations. The market for galvanized sheets is strong, some mills being booked through January. Inquiries from the West Indies call for substantial tonnages of galvanized sheets. New orders for tin plate are receding slightly. Some mills are booked through to June.

Continental markets are easier, except for billets, for which orders are being received from British users. German exports are increasing. Continental hoopmakers are organizing for export shipment trade on a price basis of £6 5s ($30.31).

Production of pig iron in Great Britain in September totaled 503,900 tons, compared with 519,000 tons in August and 537,800 tons in July. The number of active stacks Sept. 30 was 131, one more than at the close of August. Steel output in September amounted to 718,600 tons, against 648,300 tons in August and 666,900 tons in July.

Exports of British iron and steel totaled 295,123 tons in September, compared with 369,778 tons in August and 352,475 tons in July. Imports in September amounted to 184,464 tons, against 272,368 tons in August and 234,299 tons in July.

British Steel Improvement Less Than Expected

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Oct. 5.—Iron and steelmakers find the autumn revival has not been as substantial as they hoped. So far as steel is concerned British makers are in a better position as the result of a constant rise in Continental values and the cessation of supplies from that quarter. But a big section of the trade is clamoring for

Sterling $4.85

safeguarding and its supporters have been considerably encouraged by the fresh hint given by Stanley Baldwin that he is still prepared to consider some sort of protection for the heavy industries. The trade is undoubtedly divided on the question.

Greater activity is confined to the lighter qualities of steel and semi-finished material. Billetmakers have excellent orders and prices are firm. Structural engineers have good order books, particularly for the erection of picture houses, factories and reconstruction of business premises, and while railway work is disappointing one or two bridge contracts are open to tender. Again the idea of co-operation is mentioned among steel manufacturers to obtain big overseas gov-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, October 15	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$15.28	3 3 0	$15.28	3 3 0	$15.76	3 5 0
Basic	15.76	3 5 0	15.28	3 3 0	15.28	3 3 0	15.28	3 3 0
Basic-bessemer	16.98	3 10 0†	14.79	3 1 0	14.79	3 1 0	14.55	3 0 0
Hematite, Phosphorus 0.02-0.05	16.98	3 10 0	22.09	565*	.....	.....	.....	3 10 0
SEMIFINISHED STEEL								
Billets	$30.92	6 7 6	$24.49	5 1 0	$24.49	5 1 0	$24.25	5 0 0
Wire rods	41.23	8 10 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.65c	7 12 6	1.35c	6 3 0	1.35c	6 3 0	1.38c	6 5 0
Structural shapes	1.60c	7 7 6	1.12c	5 2 0	1.12c	5 2 0	1.10c	5 0 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.40c	6 7 6	1.40c	6 7 6	1.42c	6 9 0
Sheets, black, 24 gage	2.17c	10 0 0	2.32c	10 11 3	2.32c	10 11 3	2.20c	10 0 0
Sheets, galvanized, 24 gage, corrugated	2.96c	13 12 6	3.01c	13 13 9	3.01c	13 13 9	2.94c	13 7 0
Bands and strips	2.22c	10 5 0	1.38c	6 5 0	1.38c	6 5 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.60c	7 5 0	1.60c	7 5 0	1.60c	7 5 0
Galvanized wire, base	2.93c	13 10 0	2.01c	9 2 6	2.01c	9 2 6	2.01c	9 3 0
Wire nails, base	2.38c	11 0 0	1.68c	7 12 6	1.68c	7 12 6	1.67c	7 12 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.01	3 6 0	$17.20	440(2)	$16.40	590	$18.57	78
Basic pig iron	15.76	3 5 0	18.57	475(1)	16.54	595	20.95	88
Furnace coke	3.15	0 13 0	5.87	150	5.14	185	5.12	21.50
Billets	30.31	6 5 0	22.09	565	27.38	985	28.81	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.66c	7 12 6	1.30c	720	1.45c	1,115	1.52c	141
Shapes	1.71c	7 17 6	1.22c	675	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.87c	8 12 6	1.54c	855	1.49c	1,145	1.71c	158
Sheets, black, 24 gage	2.28c	10 10 0	2.92c	1,620	2.47c	1,900	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.96c	13 12 6	3.50c	1,945	3.89c	2,975	3.78c	350
Plain wire	2.12c	9 15 0	1.75c	970	2.02c	1,550	2.48c	230
Bands and Strips	2.22c	10 5 0	1.45c	805	1.89c	1,450	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £21 14s 0d ($105.25) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

ernment contracts. The scheme is said to have been arranged so that long credits may be given when these are necessary, as a Sheffield firm recently has been unable to quote because its resources would not stand the long credit htat the overseas government asked. Secrecy is being observed, however, and no definite news is obtainable.

The midland iron and steel wages board, following its bimonthly ascertainment of selling prices, has declared a reduction of 2½ per cent in ironworkers' wages to take effect Oct. 8 and to continue until Dec. 1.

Continental values continue firm and on the whole unattractive, but in the Midlands a little revival is taking place in Belgian No. 3 iron delivered in this district at £7 4s 6d ($35.03) per ton. Some nut and bolt works use this iron as the basis of their manufacture and the spurt is probably due to the fact that makers have realized there is no point in waiting for reductions from the Continent. They have made up their minds at any rate that they cannot buy Staffordshire iron at £9 ($43.65) a ton, and the makers of this material have little to do. One old established nut and bolt firm has closed its doors, and it may be that the increase in Continental material has had something to do with the shut down.

Pig iron is badly in need of a stimulus as business is moving slowly. Foundry brands were in better demand on the Birmingham exchange yesterday, particularly for heavy castings, and engineers generally are ordering more iron. What little buying has taken place has strengthened the hands of Northampton makers, some of whom are endeavoring to force up the price to £2 18s ($14.05), against the general quotation of £2 16s ($13.57). But those who have ventured on these lines have risked some orders by trying to exploit the situation. Derbyshire is firm at £3 ($14.55) and North Staffordshire is also down to the same figure. Stocks are reducing, one Derbyshire firm having considerably reduced its accumulation since the middle of August, and this concern will probably relight a furnace which has been out of commission for relining.

The feeling is more optimistic on the west coast as the hematite pig iron business revives. Reports from that district mention the placing of substantial contracts by consumers in Pittsburgh. On the whole the volume of business in pig iron in the North Lancashire and Cumberland districts is heavier than for many months. Prices are firm and unchanged.

The galvanized sheet business continues flourishing with mills well booked for the rest of the year. It is difficult to obtain promises of delivery before December of orders placed now. Among overseas contracts, which have been substantial this week, India and the West Indies have been prominent. Prices continue at £13 10s ($65.46) to £13 15s ($66.67). Inquiries have been received from the hurricane-swept areas.

The tin plate trade continues well employed with good inquiries on behalf of the Continent and the Far East. Output has been good and prices are firm at 18s ($4.37) to 18s 3d ($4.43) according to date of shipment.

Italy Makes Less Iron

Italy's output of pig iron the first half of 1928 was decidedly lower, but that of raw steel higher, than in 1927, according to the iron and steel division, department of commerce.

A total of 204,500 metric tons of pig iron was produced during these six months, the peak output taking place in May and the low point in February. This output, although reflecting the increased activity of the Italian market, in that its monthly rate was superior in the second quarter to that of the first, was considerably lower in aggregate than the trade for either 1926 (260,000 tons) or 1927 (281,500 tons).

Production of crude steel, 892,000 tons, was decidedly better than that of 1927 (868,000 tons) although it failed to measure up to that of 1926 (898,500 tons). As in pig iron, the greatest activity occurred in May with January the low month. However, the point should be made that production increased steadily over the six months and that activity of Italian steel works in second quarter of 1928 was far superior to that of the same period of 1926 or 1927.

French Output Larger

Paris, Oct. 1.—(*European Staff Service*)—French iron and steel production during August showed an increase over the figures of the preceeding month. August output of pig iron included 670,000 tons of basic bessemer, 115,000 tons of phosphorus foundry, 27,000 tons of hematite foundry, and 33,000 tons of gray forge pig iron.

August output of steel ingots and castings included 776,000 tons of steel ingots and 17,000 tons of steel castings, the ingot production being composed of 559,000 tons of basic bessemer, 220,000 tons of open-hearth, 8400 tons of electric, 4200 tons of acid bessemer, and 1400 tons of crucible steel. The following table gives figures for the first eight months of 1928 as compared with the monthly averages of the three preceding years and 1913, in metric tons:

Mon. ave.	Act. fur. on last day	Pig iron	Steel ingots and castings
1913*	131	433,940	390,580
1925	148	707,840	620,540
1926	155	785,965	702,500
1927	142	774,785	689,610
1928			
Jan.	144	809,000	753,000
Feb.	149	785,000	738,000
Mar.	149	858,000	804,000
April	150	834,000	738,000
May	150	871,000	794,000
June	148	844,000	797,000
July	148	836,000	757,000
Aug.	150	857,000	793,000

*In pre-war boundaries.

Fewer German Stacks

Berlin, Oct. 1.—(*European Staff Service*)—For the first time since 1926, the number of blast furnaces operating in Germany was under 100, the number of stacks operating Aug. 31 being 99. The August output of pig iron consisted of 674,034 tons of basic bessemer, 190,004 tons of ferro-alloys, 94,058 tons of foundry, 69,737 tons of hematite, 2182 tons of direct castings, 808 tons of gray forge, and 14 tons of acid bessemer pig iron.

August output of steel ingots and castings was composed of 1,306,194 tons of ingots and 23,151 tons of steel castings. The ingot production was composed of 673,805 tons of basic open-hearth, 605,807 tons of basic bessemer, 11,747 tons of crucible and electric, 11,398 tons of acid open-hearth, and 3437 tons of ingot iron. The following table gives figures for the first eight months of 1928 as compared with the monthly averages of the three preceding years and 1913, in metric tons:

Mon. ave.	Furnaces on 31st	Pig iron	Steel ingots and castings	Finished steel
*1913	.....	909,640	993,640	970,240
1925	† 83	848,060	1,016,210	853,840
1926	†109	803,625	1,028,470	856,340
1927	†116	1,091,875	1,358,780	1,069,930
1928				
Jan.	116	1,180,239	1,469,455	.....
Feb.	115	1,122,384	1,322,695	1,040,875
Mar.	113	1,170,476	1,421,524	1,145,070
April	107	1,045,468	1,161,405	917,673
May	104	1,044,046	1,247,781	986,459
June	103	1,021,350	1,294,583	1,067,646
July	100	1,034,694	1,311,134	1,026,332
Aug.	99	1,030,837	1,329,345	1,061,799

*In present boundaries.
†On last day of year.

British Prices Steady

London, Oct. 2.—(*European Staff Service*)—Board of trade returns for August, 1928, give average British export prices per gross ton for certain iron and steel products. These are compiled from actual contracts made several months ago, and this accounts for the difference between these quotations and the base prices regularly quoted in our columns.

Compared with those of the preceding month, prices were lower for beams, galvanized sheets, and tinplates, but higher for rails, plates, and black sheets.

August, 1928

	£	s	d	$
Foundry pig iron	3	14	5	18.05
Beams	7	18	7	38.45
Rails	8	15	4	42.52
Plates	11	1	0	53.59
Black sheets under ⅛-inch thick	12	12	9	61.29
Galvanized sheets	15	8	5	74.79
Tinplates	19	13	7	95.44

French Exports Slack

Paris, Oct. 1.—(*European Staff Service*)—Exports of the principal steel products from France during July were the lowest for the year. July exports of pig iron were the second highest of the year, the heaviest month being January with 57,496 tons.

The following table gives figures for the first seven months of 1928 as compared with the monthly averages of the three preceding years, in metric tons:

Mon. ave.	IMPORTS Pig iron	IMPORTS Steel	EXPORTS Pig iron	EXPORTS Steel
1925	2,693	11,703	58,835	272,270
1926	1,990	11,930	58,545	264,530
1927	3,230	6,490	69,640	363,395
1928				
Jan.	2,472	3,663	57,496	328,269
Feb.	5,246	7,548	49,515	415,148
Mar.	4,422	8,913	57,534	377,351
Apr.	2,864	10,348	46,499	319,753
May	4,506	10,803	48,725	319,028
June	2,423	13,132	39,876	323,300
July	2,857	9,950	51,796	259,766

Industrial Men in the Day's News

H. G. Walton, General Manager of Sales, Bethlehem Steel Co.

HIS background in the steel industry has fitted him capably for the responsible office to which he was appointed recently.

IT WAS not until after he had learned all the phases of the operating departments of his company that he devoted himself to the sales office, with subsequent rapid advancement.

HE IS an enthusiastic golfer and participates in administrative affairs of the country club of which he is a member.

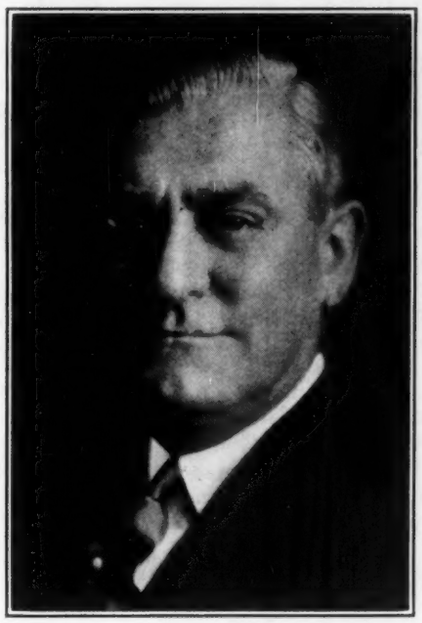


Photo by Blank-Stoller Inc.

WITH a background of the steel industry that affords him a full knowledge of the products handled by his company, Harry G. Walton can be expected to fill capably the position of general manager of sales of the Bethlehem Steel Co., Bethlehem, Pa., to which he was appointed recently.

Mr. Walton was born in Bethlehem and received his early education in the schools of that city. He first entered the steel industry in 1899 when he became associated with the Bethlehem Foundry & Machine Co. He served in the various departments of the operating end of the business gaining valuable experience, after which he went with the sales department in 1904. He was sent to New York and placed in charge of the company's office.

Mr. Walton's first connection with the Bethlehem Steel Co. was made in 1908 in the sales department. He took charge of foundry products, including ingot molds, and iron, steel, mayari and brass castings. In 1923 he was given charge of the sale of forgings, axles, auto truck and car wheels as well as foundry products.

In April, 1928, Mr. Walton was advanced to the position of assistant general manager of sales, serving under Paul Mackall. When Mr. Mackall was made vice president in charge of general sales of the Bethlehem company, Mr. Walton was appointed his successor as general manager of sales.

Mr. Walton's home is in Bethlehem. He is an enthusiastic golfer and participates in the administrative affairs of the golf club of which he is a member, the Saucon Valley Country club.

WILBUR B. TOPPING, who has resigned as general manager of sales of the Republic Iron & Steel Co., effective Nov. 1, will on that date become general manager of western sales of the Bethlehem Steel Co., with headquarters at Pittsburgh. Mr. Topping, the son of John A. Topping, chairman of the Republic company, had been with the Republic company since 1911, as noted in IRON TRADE REVIEW of Oct. 11.

* * *

John W. McMahon has been appointed superintendent of the cold strip department at the Warren Works of the Republic Iron & Steel Co., Youngstown, O., succeeding H. A. Fisher, who resigned about a month ago. Before going to Warren, Mr. McMahon was employed by the Superior Steel Co., Carnegie, Pa., for 25 years.

* * *

J. S. Stanier has been named by Newton Steel Co. as a special mill representative working out of the Newton Falls, O., mills. He formerly was with the West Penn Steel Co.

* * *

Robert C. Norton, treasurer of Oglebay, Norton & Co., has been elected a director of the American Ship Building Co., Cleveland.

* * *

George F. Joyce has been appointed assistant sales manager for Chicago and vicinity of the Magnetic Mfg. Co., Milwaukee.

* * *

C. W. Russell, vice president and general manager of the Russel Wheel

& Foundry Co., Detroit, for a number of years, resigned Oct. 1.

* * *

Harold L. Crull has been appointed assistant sales manager of the Oilgear Co., Milwaukee.

* * *

W. R. Crosett, formerly with the United States Steel Corp., has been appointed comptroller of the Kelvinator Corp., Detroit.

* * *

F. L. Dayton has been named president of the Wayne-Dayton Co., succeeding his father, F. E. Dayton, who has retired.

* * *

E. J. Raymond, sales manager of the Australian Oxygen & Industrial Gases Pty. Ltd., Melbourne, Australia, is in the United States studying welding methods.

* * *

J. Leonard Replogle, for many years a well-known figure in the steel industry, will become a special partner in the New York stock exchange organization of Harris, Winthrop & Co., New York, Nov. 1.

* * *

Harry Saxer, superintendent of blast furnaces at the Aliquippa Works of the Jones & Laughlin Steel Corp., Pittsburgh, has been made assistant general superintendent of that works, succeeding Grenville Lewis, who has resigned. Mr. Saxer has been succeeded by R. A. Field.

* * *

R. J. Working has been named district sales manager in Cincinnati for the Central Alloy Steel Corp., Massillon, O. For a number of years he has been connected with the sales department at the corporation's general offices in Massillon. He succeeds J. O. Dearth, who has resigned.

* * *

F. A. Scammell, assistant general manager of the Cambria plant of the Bethlehem Steel Co., Johnstown, Pa., has resigned. He has been with the Cambria plant since 1919, serving in various capacities. Mr. Scammell will locate in New Jersey, where he plans to enter business for himself.

* * *

Maximilian N. Bodenbach has resigned as chief engineer of the Electro-Mechanical Engineering Co., Milwaukee, and opened offices at 502 Commerce building, Milwaukee, where he is now engaged in business as advisory engineer, servicing manufacturers, architects and inventors with electrical engineering.

* * *

Charles Ramsden has been made general manager of the Pacific Coast Engineering Co., Oakland, Calif. Mr. Ramsden is well known on the Pacific coast and has for many years been connected with the plate fabricating industry there. From 1909 to 1919 he was chief engineer of the Western Pipe & Steel Co. In 1919 he resigned to become president of the Steel Tank & Pipe Co., Berkeley, Calif.

N. L. MORTENSON

Newly-appointed chief engineer of Cutler-Hammer Mfg. Co., Milwaukee, as announced in Iron Trade Review last week

Scrap Rates Declared Unreasonable

Washington, Oct. 16.—Rates on scrap iron and steel, in carloads, from Carnegie, Pa., to Steubenville, O., and Weirton, W. Va., have been found unreasonable by the interstate commerce commission in a decision in the case of the Charles Dreifus Co. against the Pennsylvania railroad.

The commission found also, in the same case, that the rates charged on scrap iron and steel, in carloads, from Weirton to Carnegie were unreasonable prior to Jan. 15, 1927, and inapplicable subsequent to that date. Rates charged on scrap iron and steel, in carloads, from Steubenville to Carnegie were found unreasonable prior to Sept. 1, 1927, and inapplicable subsequent to that date. Reparation was awarded.

Obituaries

EDWARD H. SWINDELL, 61, treasurer of William Swindell & Bros., Pittsburgh, makers of melting, heat treating and annealing furnaces, and president of American Dressler Tunnel Kiln Co., New Castle, Pa., died Oct. 11. He was a graduate of Lafayette college.

* * *

Morris B. Dean, vice president of the Schramm Mfg. Co., Philadelphia, manufacturer of airplane motors, died recently.

* * *

Sylvanus W. Brown, owner of the Press Metal Co., Pawtucket, R. I., died in that city recently. Mr. Brown was an inventor and had perfected several improvements on typewriters. For 27 years he was foreman of the experimental department of the Taft-Pierce Co., Woonsocket, R. I.

* * *

Samuel Newman, president of the Newman Mfg. Co., Norwood, O., and the Newman Lighting Fixture Co., Cincinnati, died Oct. 9, aged 75. Mr. Newman began in the fixture manufacturing business in 1882 and is said to be the first manufacturer of brass beds in the country. He had invented numerous labor-saving machines and mechanical devices.

* * *

Silas M. Haight, for the past several months, research engineer for the Sweet's Steel Co., Williamsport, Pa., died Sept. 30, following an automobile accident near Liverpool, Pa. Mr. Haight was formerly connected with the Highways Products Mfg. Co., Elmira, N. Y., and was regarded as an expert in road construction work. He was a graduate of Lafayette college, class of 1907.

* * *

John Martin Bentley, for many years auditor for various subsidiaries of the United States Steel Corp., died Oct. 13 at his home in San Diego, Calif. He was born in Youngstown, O., July 29, 1860, and was a brother of the late Robert Bentley, former president of the Ohio Iron & Steel Co. John Bentley first was second auditor for the Illinois Steel Co. for four years at Joliet, Ill.; then with the Buhl Steel Co., Sharon, Pa.; then secretary for the Monessen Steel Co.; then auditor for the American Steel Hoop Co. at New York; and finally for 16 years with the Carnegie Steel Co. at Pittsburgh. He retired some years ago.

Fluorspar Tariff Report Before President

Washington, Oct. 16.—President Coolidge has informed callers that he has received the fluorspar report from the tariff commission. Before any action is taken by the President these reports automatically go to the interested government departments.

In this case, it was stated at the White House, the report has been sent to the department of commerce to see what effect any change in tariff would have on American commerce. When a report has been made by the department of commerce the survey goes to the treasury department for the drafting of a proclamation. This is a routine matter but it is expected that it will be some days or perhaps more before the proclamation is announced by the President. It is generally conceded that the tariff will be raised the full 50 per cent allowable under the flexible provisions of the present tariff law.

As pointed out in this paper last week the present tariff on fluorspar is $5.60 per long ton, which with the 50 per cent increase, would raise it to $8.40.

It is not the province of the tariff commission to recommend any change to the President in any rates. On the other hand the report of the commission shows conclusively in this case that the cost of production abroad is far lower than it is in this country. All of this information was made public at the time the statement of information was published by the commission and it was not controverted at the closing arguments before the commission in this case.

Birmingham Exports Iron

Birmingham, Ala., Oct. 16.—Alabama producers of pig iron are shipping 5000 tons to Mobile, Ala., for export in foreign bottoms. Water shipments of miscellaneous steel products to the Southwest are increasing. Weekly shipments are being made down the Warrior river for distribution in the Southwest. In addition to the government barge service the Tennessee Coal, Iron & Railroad Co. is operating a barge service of its own. The Reeves Bros. Co., is shipping tank plates for oil storage tanks in Texas.

Warwick Properties Sold

Philadelphia, Oct. 16.—Local scrap dealers bid in the two blast furnaces and auxiliary equipment of the Warwick Iron & Steel Co., Pottstown, Pa., offered at auction last week by Samuel T. Freeman & Co., and will wreck them. All of the company's properties were sold at auction.

September Employment Exceeds 1927

Washington, Oct. 16.—Employment in manufacturing industries increased 1.5 per cent in September compared with August and payroll totals increased 1.3 per cent, according to the bureau of labor statistics, department of labor.

There was a considerable increase in employment in the machine tool industry in September compared with August and an increase of 2.9 per cent in automobile employment.

In September of this year compared with last year there was a gain of 3.3 per cent in employment in the nonferrous metal group and the iron and steel group gained 2 per cent.

New York Scrap Dealers Form Chapter

New York, Oct. 16.—David Strauss, president of the Continental Iron & Steel Co., 33 Rector street, New York, has been elected chairman of the New York chapter of the Institute of Scrap Iron and Steel.

The other officers of the New York chapter include Thomas G. Watson, Brooklyn, first vice chairman; Howard Vandewater of W. Vandewater Inc., Brooklyn, second vice chairman; Al Gerson of Harlem Metal Corp., New York city, secretary; Louis Fisher, of Fisher Bros. Scrap Iron & Steel Co., New York city, treasurer; John McGrath of McGrath Iron Co. Inc., Brooklyn, Charles Pfeiffer of Charles Pfeiffer & Co. Inc., New York city, and Harry Daly of the Harry A. Daly Iron & Steel Co., Long Island city, executive committee. Herman D. Moskowitz, of M. Samuels & Son, presided at the New York conference which elected the above.

General Electric Orders Show Increase

Orders received by the General Electric Co. for the three months ended Sept. 30 amounted to $90,328,666, compared with $77,420,263 for the corresponding quarter of 1927, an increase of 17 per cent, President Gerard Swope states.

For the nine months ended Sept. 30 orders amounted to $260,686,463, compared with $233,076,091, for the first nine months of 1927, an increase of 12 per cent.

Metallurgical Board Is Meeting in Pittsburgh

The metallurgical advisory board to the Carnegie Institute of Technology and bureau of mines has invited all those interested in metallurgical research to attend the second open meeting of the board to be held at Pittsburgh, Oct. 19. Morning and afternoon sessions will be held in the auditorium of the bureau of mines with a dinner and evening session at the Pittsburgh Athletic association. A number of prominent metallurgists will appear on the program which briefly is as follows:

MORNING

Case Carburizing Research

Illustrated report, by Dr. V. N. Krivobok, associate, bureau of metallurgical research.

Bureau of Metallurgical Research

Progress report, by Dr. F. M. Walters Jr., bureau of metallurgical research.

"Application of X-Rays to the Study of Metals," by Dr. J. B. Friauf, associate, bureau of metallurgical research.

Illustrated report on metallurgical work, by Dr. V. N. Krivobok.

Report of iron-manganese alloys, by Dr. V. N. Krivobok.

AFTERNOON

Physical Chemistry of Steelmaking

Illustrated progress report on fundamental studies in the laboratory, by Dr. C. H. Herty Jr., physical chemist, bureau of mines.

Illustrated progress report on plant research on the open hearth, by Dr. C. H. Herty Jr.

EVENING

Dinner meeting with Dr. Thomas S. Baker, president, Carnegie Institute of Technology, presiding.

Address, by Dr. W. H. Hatfield, director of research, Brown-Firth Research Laboratories, Sheffield, England.

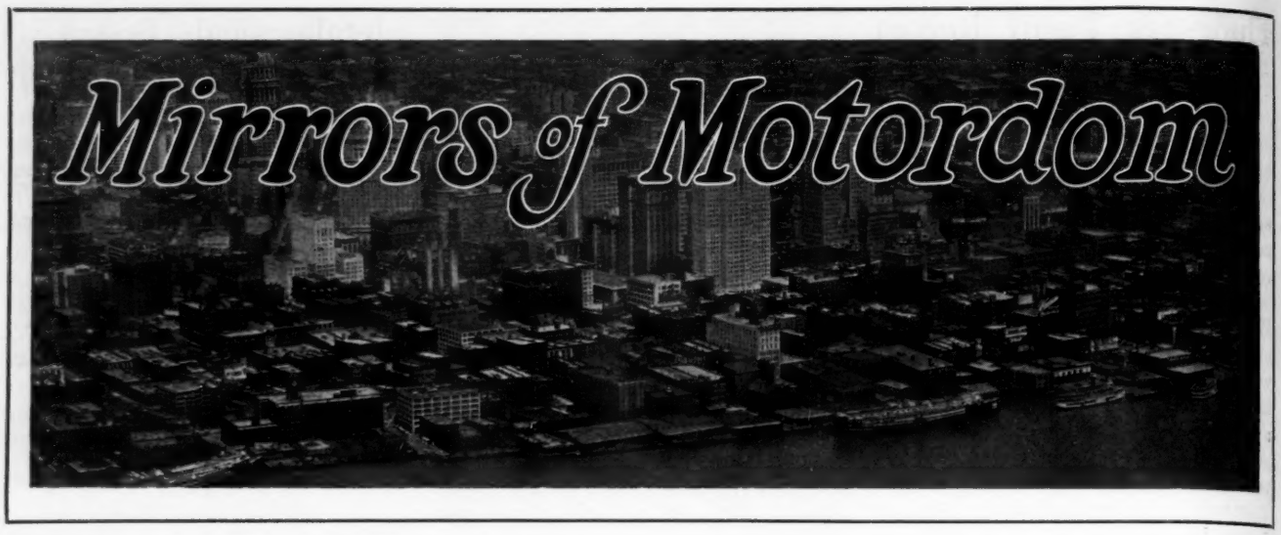
"Looking Ahead," by Scott Turner, director of research, bureau of mines.

Announces Fall Meeting

The fall meeting for 1928 of the Eastern States Blast Furnace and Coke Oven association will be held Oct. 26 at the Shannopin Country club, Ben Avon, Pa. Following luncheon, a joint round table discussion of coke oven and blast furnace topics is scheduled at which A. E. Maccoun, superintendent of blast furnaces, Edgar Thompson works, Carnegie Steel Co., Braddock, Pa., will preside. Dinner will be served at 6:30 p. m. and will be followed by a discussion of "Stream Pollution with Special Reference to Coke Plant Wastes." Special buses will leave the William Penn hotel for the club at 9:30 and 11:30 a. m. and 1:30 p. m. and will return at 10 p. m.

Trackwork Output Down

New York, Oct. 16.—Production of track work for tee rail track of 60 pounds per yard and heavier in September was 10,767 tons, compared with 11,040 tons in August and 10,999 tons in September, 1927. Third quarter production was 33,583 tons, compared with 41,368 tons in the second quarter of 1928 and 37,603 tons in the third quarter of 1927.



Detroit Consumers Insatiable; Auto Output Holds

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8,000,000 Output Next Year? Ford Uses Malleable

Detroit, Oct. 16

STEEL, steel and more steel for the almost insatiable maw of the great consuming territory represented by the Greater Detroit area (soon to outstrip Philadelphia as the third city, they say here), is causing customers to put more pith into and more urgency behind their Macedonian calls to their supply sources, "Come over and help us," or "What can you do to help us?" Not only does the automotive industry anticipate a sustained demand almost throughout the fourth quarter (it believes a letdown will come during the holiday and inventory period) but it already is lining up increasingly large requirements for the first three to six months of next year.

If 1928 establishes a new high record for automobile and truck production, which it bids fair to do, plans are being laid by the General Motors Corp., the Ford Motor Co., the Chrysler-Dodge Corp., and others for even greater performances during 1929. Roughly speaking, at the moment 1928 looks like a 4,600,000 to 4,750,000-unit year (the previous high was 1926 with 4,503,529), and unless 1929 brings disappointment it will be a 7,000,000 to 8,000,000-unit year. With an estimated total of 3,000,000 cars scrapped each year, this will leave a net of 4,000,000 to 5,000,000 to be absorbed and added to the 23,000,000 cars now extant. Where these cars are all going is the question often asked but never answered except by the concrete evidence proffered by sales sheets that they are taking their places on the already crowded roads.

* * *

THAT September saw an output exceeding 460,000 striking a new high note, the August total being 458,429, the record breaker to date, is generally admitted here, for while Chevrolet's output has been negligible since it stopped making the 4-cylinder car three weeks ago, Ford's output on the other hand has daily risen until now it is estimated that the average is nearer 5750 than the 5600 officially announced since on outstanding days 6000 is reached. This production rate, it is said, means a slight profit for the company but about 500,000 cars have been produced to date without that desirable feature.

Unfilled orders despite cancellations because of deferred deliveries still exceed 600,000 units. When the Ford foundry delivers 6000 motor blocks a day, that day sees a 6000 aggregate assembly. This will be increased as soon as possible to 8500, that being the record daily output reached during 1926. It is expected that by early 1929, Mr. Ford will achieve his ambition of putting 10,000 cars through the assembly lines. He says: "If we could put out 20,000 daily we could sell them—the so-called saturation point is a long ways off." Every Ford assembly plant in the world has been operating since Oct. 1.

* * *

DETROIT'S malleable casting foundries are greatly elated over the prospects of the Ford Motor Co. substituting malleable castings for drop forgings on model A. This car as initially produced had no malleable castings whatever, even the small shield on the bumpers being a forging. Because of difficulty encountered in the delivery of drop forgings, however, it is understood that now about 20 pounds of malleable castings are being used in each car and this may be increased. Model T had over 100 pounds of malleable and while 20 pounds per car at present assembly rates means only 50 tons or so per day, if additional changes are made the local malleable foundries will gain in proportion since the Ford foundry makes no malleable. During this period of transition the model AA truck for some reason or other retained its content of malleable castings.

* * *

IT WAS thought possible that the General Motors Corp. might dramatically present its new 6-cylinder Chevrolet as the piece-de-resistance at its third fall salon, being held at its building here this week. It has 83 cars in the exhibition, including the new All-American Oakland and Pontiac line, but not a word has appeared about the new Chevrolet. This interest's policy always has been to have everything in readiness for quantity order taking and quantity shipments before making its announcements.

Insofar as many raw material sources of supply are concerned, however, the new model has been reached,

(*Concluded on Page* 1038)

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

SIMONDS WORDEN WHITE CO., Dayton, O., has been formed by combination of the L. & I. J. White Co., Buffalo; Worden Tool Co., Cleveland; A. A. Simonds Co., Dayton, O., and R. J. Dowd Knife Works, Beloit, Wis. Headquarters are at Dayton. H. I. Simonds is president and treasurer, Walter S. Walls, vice president and Frank R. Henry secretary. Directors include Walter S. Walls, Edward B. Holmes, W. E. Bonesteel, Henry Scheurer, H. I. Simonds, Frank R. Henry, Frank Gardner, M. A. Henry and C. M. Henry.

* * *

GLASGOW IRON CO., Philadelphia, has moved its offices to Pottstown, Pa., where its works is located.

* * *

WHITING CORP., Harvey, Ill., manufacturer of foundry equipment, has appointed D. S. Mair Machinery Co., Houston, Tex., its representative in that territory.

* * *

SMITH & SMITH, Akron, O., have been organized to act as metallurgists and chemists for the metalworking industry. Services of the company are offered to any industry where any feature touches metallurgy.

* * *

JONES BROS. STRUCTURAL STEEL CO., Ravenna, O., has bought the Industrial Metal Products Co., Ravenna, and will operate it as a separate company. Purchases for both companies will be made by the former.

* * *

HOPE ENGINEERING CO., Mt. Vernon, O., has sold its manufacturing business to the C. & G. Cooper Co., Mt. Vernon, engine builder. The Hope company will develop its engineering business in the gas and oil industry.

* * *

MILWAUKEE FOUNDRY EQUIPMENT CO., Milwaukee, has purchased a tract at 1204 South Pierce street, Milwaukee, and is constructing a new brick unit 70 x 229 feet. It is expected the new plant will be occupied by Dec. 15, with production and assembling carried on under one roof.

* * *

WAYNE PUMP CO., Fort Wayne, Ind., has bought the Boyle-Dayton Co., Los Angeles, manufacturer of gasoline pumps. The name of the latter will be changed to Wayne-Dayton Co. F. E. Dayton, president, will retire and be succeeded by his son, F. L. Dayton. No other changes will be made in personnel.

* * *

WASMER BOLT & NUT CO., Cleveland, recently incorporated to manufacture bolts and nuts, has established a plant at 13100 Athens avenue, Lakewood, a suburb of Cleveland. J. C. Wasmer is president and M. J. O'Donnell, vice president and treasurer. New equipment for production of carriage and machine bolts has been installed.

* * *

WESTERN STAMPING & MFG. CO., St. Paul, has leased 30,000 square feet at Parma, a suburb of Cleveland, and will establish a plant for the manufacture of automobile license plates, street and highway metal signs and general sheet metal stamping. The plant under lease was occupied formerly by the Perfection Coaster Co. T. R. Wilwerscheid is president, and P. A. Preus is general sales manager.

* * *

GRAY IRON INSTITUTE, Terminal Tower, Cleveland, has enrolled the following concerns in its membership: Detroit Gray Iron Foundry Co., Detroit, Hugh Martin, president; G. & C. Foundry Co., Sandusky, O., J. E. Carroll, vice president and general manager; Elizabeth Street Foundry Co., Chicago, A. W. Lemme, president; Osborn Mfg. Co., Cleveland, Franklin Smith, president; Trumbull Mfg. Co., Warren, O., M. L. Derge, representative.

* * *

TAYLOR-WHARTON IRON & STEEL CO., Highbridge, N. J., is organizing a sales company, with headquarters at Ft. Worth, Tex., which will handle sales of the Taylor-Wharton Iron & Steel Co., Highbridge, N. J., and William Wharton Jr. & Co. Inc. Easton, Pa., in Texas and Oklahoma. John C. Taylor, formerly manager of sales for Taylor-Wharton, heads the new company.

G. V. Wood, who was western sales manager for Taylor-Wharton Iron & Steel Co. and William Wharton Jr. & Co. Inc., with headquarters in San Francisco, has been transferred to Highbridge and has been given charge of manganese steel sales.

All sales managers of these companies now are reporting to G. R. Hanks, vice president, with headquarters at Highbridge. G. M. Griffiths, Easton, is manager of track work sales; W. R. Tyson, Easton, is manager of sales of oil well tool joints, airplane cylinders and forged grinding balls. C. B. Andrews, Easton, is manager of sales of steel castings and miscellaneous seamless forgings. F. C. Roberts Jr., Easton, is manager of machinery sales and J. C. Minor, Easton, is manager of sales of gas cylinders.

* * *

HUMBLE OIL & REFINING CO. has started laying the gas line from its refinery at Engleside to its water terminal at Corpus Christi, Tex.

* * *

NEW HOME SEWING MACHINE CO., Orange, Mass., has been taken over by the Consolidated Industries, Rockford, Ill. Operations will be continued at the Orange plant, but the offices of the New Home company will be moved from New York to Rockford.

* * *

COSTELLO ENGINEERING CO., Pittsburgh, has received an order for six tin mill pair furnaces for installation at the plant of the Columbia Steel Co., Pittsburg, Calif. This is in addition to four furnaces installed last year at the company's Torrance, Calif., plant. The Costello company also has received an order for 20 tin mill pair furnaces for installation at the plant of the Standard Tin Plate Co., Canonsburg, Pa. This completes an installation of 24 furnaces.

* * *

MOTH AIRCRAFT CORP., British manufacturer of two-seater airplanes, will establish an American branch factory at the Chicopee, Mass., plant of the Rauch & Lang Co. Negotiations are now in progress to bring two more airplane manufacturing firms to Western Massachusetts. The Moth corporation, besides taking a lease on the Chicopee plant is also planning to obtain a landing and testing field adjoining the plant. An unconfirmed report also has a well known Springfield automobile concern

as about to manufacture airplane motors and the project is linked with the decision of the Moth Corp. to locate its American branch in that section.

* * *

FISHER BRASS CO., Delaware, O., has completed construction of an office building and has enlarged its plant at Marysville, O.

* * *

RESEARCH MFG. CO., Philadelphia, has been made distributing agent by E. I. duPont de Nemours & Co. for a new pickling compound just worked out by the latter's laboratory. The compound has within itself an inhibitor to prevent over-pickling or pitting and suppresses the flow of hydrogen. Fumes are thereby prevented.

* * *

UNITED ENGINEERING & FOUNDRY CO. will furnish the new 6-stand 4-high roller bearing continuous skelp mill to be installed by the National Tube Co. at its National works, McKeesport, Pa. The United company will also furnish the six hot mills of the new tin plate plant of the Columbia Steel Corp. at Pittsburg, Calif. On this latter job, the Hyde Park Foundry & Machine Co., Hyde Park, Pa., will furnish the six cold mills, Mesta Machine Co. the hot mill drives, and Gears & Forgings Inc., the cold mill drives.

* * *

HARRISBURG FOUNDRY & MACHINE CO. INC., Harrisburg, Pa., has been incorporated and has taken over the business of the former Harrisburg Foundry & Machine Works, receivership of whose affairs has been terminated by sale to the new company. C. W. Lynch is president of the new company. He formerly owned and operated the plant, before selling his interest in 1920. Manufacture will be continued of the lines of engines which the company has produced for several years. The foundry and machine shops are well equipped and ready for business.

* * *

DALLAS BRASS & COPPER CO., 820 New Orleans street, Chicago, through Charles D. Dallas, president has purchased the remainder of the vacant land in the West Grand avenue industrial district, comprising 466,356 square feet, adjacent to the Chicago, Milwaukee, St. Paul & Pacific railroad tracks. Previous to acquiring this property the Dallas Brass & Copper Co. owned about 490,000 square feet, upon which the present plant and rolling mill is situated, and which is adjacent to the property just bought. The present purchase was made for future expansion of the company's plant. No announcement has been made as to details of the proposed expansion.

* * *

MIDLAND BARGE CO., Pittsburgh, has launched the second of three modern steel towboats constructed for the Union Barge Line Corp. The third is expected to be launched this week. It is expected to have the steamers ready to open freight service between Pittsburgh and Memphis before Jan. 1. American Bridge Co. expects to launch the first of a fleet of nine steel standard coal carrying barges from its Ambridge yards next week. Nine other barges of the same type are being built by the Dravo Contracting Co., while five cargo box barges, all for the Union Barge Line, are completed. The line is the first concern to take advantage of the canalized Ohio river, as a carrier of freight, with new equipment constructed for that service.

Pittsburgh Seeks Better Rates to Southwest

Pittsburgh, Oct. 16.—Reopening of the fight of Pittsburgh shippers for better freight rates to the southwest was announced last week by Donald O. Moore, traffic secretary of the chamber of commerce. E. G. Siedle, traffic manager of the Armstrong Cork & Insulation Co. and vice chairman of the shippers' council of the Pittsburgh chamber, representing Mr. Moore, testified at the interstate commerce commission hearing last week at Galveston, Tex. in the rail and ocean rate case, interstate commerce commission docket 14880.

Mr. Siedle stated Pittsburgh shippers wanted joint through rail and ocean rates to Houston and Galveston, also joint through rail, ocean and rail rates to interior southwestern points within a reasonable distance from the ports, on a basis of sufficiently less than the all-rail rates to make it attractive to use the rail and water service.

On iron and steel articles, such as structural shapes, plates and bars, the all-rail rate from Pittsburgh to Dallas is 95 cents per 100 pounds, compared to a proposed rail, ocean and rail rate of 94 cents, and the present rate for rail and water movement of 3.7 cents, Pittsburgh to East Pittsburgh, and 87 cents beyond, or a total of 90.7 cents.

Timken Buys Tube Works

The Weldless Tube Co., Wooster, O., has been purchased by the Timken Roller Bearing Co., Canton, O., from John C. Schultz, receiver, for $200,000. The plant, which was described in the June 28, 1923, issue of IRON TRADE REVIEW, is expected to be placed in operation in a few weeks, after an idleness of four years. It is on a 114-acre tract and has a normal capacity of 1500 tons per month of hot-rolled and cold drawn seamless tubing and formed products up to 3½ inches diameter.

Southern New England in Scrap Institute

At a conference of scrap iron dealers in Hartford, Conn., Oct. 10, a Southern New England Chapter of the Institute of Scrap Iron and Steel was organized, with Harry S. Blumenthal, of Suissman & Blumenthal, Hartford, as president. The other officers of the chapter elected at the meeting, include Nathan Katz of Jacob A. Katz & Sons, Hartford, Conn., first vice president; Robert Ehrlich of Moses Ehrlich Iron & Metal Co., Springfield, Mass., second vice president; Harris Botwinick of the Harris Iron & Metal Co., New Haven, Conn., treasurer; Harry Goodman of H. Goodman & Sons, Springfield, Mass., secretary; H. Kasden of H. Kasden & Son, New Haven, Conn., J. A. Merson of J. A. Merson, Inc. of Bridgeport, Conn., and Barney Carlson of Springfield, Mass., members of the executive committee.

Benjamin Schwartz, director general of the Institute and William H. Corbin, executive vice president of the Hartford chamber of commerce, were the speakers. The Southern New England chapter is the third to be organized recently for the institute, the others being the New York chapter, with David Strauss president, and the Philadelphia chapter, with John R. Briggs president.

A dinner meeting of scrap iron dealers in Baltimore was held Oct. 16, and a similar meeting for the dealers in Reading, Allentown, Bethlehem, Coatesville, Easton, Harrisburg, Lancaster, Lebanon, Pottstown, Pottsville and York, Pa., will take place at the Berkshire hotel, Reading, Oct. 23. Dealers of Trenton, N. J., met at luncheon at the Stacy-Trent hotel, Oct. 17.

Books Auto Business

Detroit, Oct. 16.—The Hydraulic Pressed Steel division of the Truscon Steel Co., Cleveland, has been awarded a year's contract for automobile frames by the Graham-Paige Motor Car Co., Detroit. The division also has been awarded an order for step hangers which is claimed to be the largest ever placed at one time.

Machinery

Present Activity Indicates October May Prove a Better Month Than September—Inquiries Are More General

SALES of machine tools and shop equipment appear to be good in all important districts, particularly in the Middle West. It is not improbable that the October totals will surpass the business placed in September and altogether a satisfactory month. No unusually large lists are pending but the number of small inquiries is sufficient to keep manufacturers and dealers busy. The automotive industry has throttled down its taking of machinery and some recession is noted from farm equipment makers. At the same time, general industrial buying has expanded. For lighter types of equipment, the radio and airplane industries are proving good customers. Several railroads are asking for small lots and are placing the business as necessity demands.

New York, Oct. 16.—Reflecting holiday influences, the local machine tool market during the past week has been less active. Some machine tool houses here were closed from Thursday until Monday. The lull is regarded as more or less temporary, however, as substantial business is pending. Current inquiries include seven or eight machines for the Otis Elevator Co., mostly for its plant at Yonkers, N. Y. General Electric Co., Schenectady, N. Y. continues to bring out inquiries, although in lesser volume, but has placed few orders recently. Fresh railroad inquiry appears at a virtual standstill. Crane buying over the past week has been as slow as at any time this year. Sellers report a fair amount of inquiry, but orders are coming through most slowly. However, prices on conveying equipment have been holding at fairly good levels, with a result that builders on such business as has been booked have realized a better profit than a year ago, when in some cases actual losses were recorded.

Worcester, Mass., Oct. 16.—New business and inquiry holds steady in the machine tool market. With makers of production machinery, business is in some instances decidedly brisk. New business covers a wide range of industries. There is an absence of large lists, but the total volume of business being placed is larger than appears on the surface. The automobile industry is taking a fair number of production tools, one firm selling a fair list of production lathes this week to a Detroit interest. The radio and airplane makers are also good buyers of lighter machinery and the demand from these fields is growing. A large maker of radios and other units in Western Massachusetts is reported to be about to enter the airplane motor field. Grinding and automatic machinery is in good demand from a diversified field. Small tools are selling well with indications of stocks in jobbers' and retailers' hands at a low point. The used tool market is weakened by low prices and the volume of used machinery available.

Chicago, Oct. 16.—Machine tool buying is holding up to expectations, and the October sales volume gives promise of exceeding the high total of September. Numerous scattered sales among all metal-working lines are reported. Several dealers in this territory point out that about 60 per cent of their business in the past few months has been with the tractor builders. Tractor concerns are closing on pending inquiries. International Harvester Co. is transferring a large number of machine tools from its Chicago tractor works to its Rock Island, Ill., tractor plant, and is filling in with fresh purchases. Studebaker Corp. has purchased 20 small punch presses for its South Bend, Ind., plant. Several smaller shapers were sold during the week to local manufacturers, but in general shapers have been moving slowly in the past few weeks. Smaller sheet-metal working equipment is moving well, but little buying has been reported recently in shears, rolls and heavy-duty power sheet metal working machines. Radial drills continue to move moderately well. Chicago board of education has several inquiries out for vocational and technical high schools, but considerable of this inquiry is for woodworking tools. Chicago & North Western railroad is expected to close on a number of tools soon, and the Chicago, St. Paul, Minneapolis & Omaha is receiving bids on two turret lathes, two 18 x 20¼ x 12 engine lathes, a 24-inch shaper, a 3000-pound hydraulic hammer and spring shop equipment.

Pittsburgh, Oct. 16.—The machinery market lacks feature in this district, both new inquiry and awards being fairly steady, although the latter is restricted to a few tools at a time and large jobs still are absent. One or two sellers, however, note an improvement in recent business although others see little change from the quiet rate of buying that has prevailed for some time. The crane market is quiet, both as to awards and inquiry.

Cleveland, Oct. 16.—Business in this district is looking up and despite the fact that the automotive industry is providing less in the way of equipment orders than it has for some time. The present demand seems to be of a general nature and inquiries are not issued far in advance. As the demand increases, deliveries are pushed farther away. For most standard equipment, 30 days appears to be the extreme, but where special types are involved, four or five months are being named. Used equipment enjoys a steady demand.

CRANE ORDERS PLACED

Included in recent orders taken by H. D. Conkey & Co., Mendota, Ill., are: one 6-ton double-girder 2-motor electric crane for Brennan Stone Co.; one 1-ton motor-driven top-running crane for Hudson Motor Car Co., Detroit; one 5-ton double girder wire rope drum crane for Dakota Power Co., Rapid City, S. Dak.; one 3-ton underhung crane for Endicott Forge & Mfg. Co., Endicott, N. Y.; four 2-ton underhung push cranes for city of Topeka, Kans.; one 8-ton hand geared underhung crane for St. Louis & San Francisco railroad, St. Louis; two 2-ton single I-beam hand geared cranes for Great Lakes Forge Co., Chicago; one 10-ton double girder powerhouse crane for Wisconsin Power & Light Co., Madison, Wis.; two 3-ton wall bracket jib cranes and one 3-ton underhung electric crane for Dallas Brass & Copper Co., Chicago.

8-ton handpower crane for export; placed through New York company with New Jersey Foundry & Machine Co.

CRANE ORDERS PENDING

Locomotive crane for New York Central; previously noted as pending, expected to be closed this week.

Johnstown Asks River Navigation Aid

Johnstown, Pa., Oct. 16.—Members of the river improvement committee of the chamber of commerce, which is working to bring about slackwatering of the Allegheny, Kiskiminetas and Conemaugh rivers to this city, opening the way for barge transportation, met recently to act on the adoption of a report to be sent to the Pittsburgh district office of the United States army engineers to acquaint them with possibilities of the project.

From this report the United States engineers will determine whether a survey of the river territory to this city is warranted.

Slackwater navigation on the rivers as far as Johnstown is provided for in plans of the Kiskiminetas and Conemaugh Rivers association, formed several years ago. Officials of the Cambria plant of the Bethlehem Steel Corp. also have a deep-seated interest in the proposed use of the streams for navigation.

Will Build Steelworks

Tulsa Rolling Mills Co., Tulsa, Okla., is building a plant at Sand Springs, Okla. for the production of reinforcing bars, forging billets and blooms which will have an annual output between 50,000 and 60,000 tons. The program, as contemplated, includes the erection of two 60-ton basic open-hearth furnaces, a 1½-ton electric furnace and the necessary roughing and finishing mills.

Mirrors of Motordom

(*Concluded from Page* 1034)

their specifications for steel for the 4-cylinder job having ceased a few weeks ago. For instance, fender stock on which they now are working calls for a longer and wider strip, namely 40 x 80 inches. The old specified 35 x 69 inches, a difference of 55 square inches. At the rate of 1½ pounds per square foot, this means about ¼-pound more of sheet metal for each fender or about a pound more per car. Motor blocks undoubtedly will be prepared at Saginaw, although the initial order for 2000 was executed at Pontiac. In some quarters it is stated that the new Chevrolet's motor will be interchangeable with the Pontiac.

Reports prevail around Detroit that the new Chevrolet will sell at the price of the present 4-cylinder. The question therefore, uppermost in the trade is: "Is the General Motors Corp. endeavoring to lift itself out of the cheap car producing class or is it endeavoring to lift the cheap car plane higher?" It remains to be seen whether the buyer of the so-called "cheap" car will be willing to acquire the added upkeep expense of the two additional cylinders even if the initial cost is the same.

* * *

BUICK last Wednesday made 1142 cars. Its highest daily output since it brought out its 1929 silver anniversary line (the first Buick appeared in 1904) was possibly 1350, the general average being 1200. It has scheduled for production between now and Dec. 15, when it will go down for inventory, 139,000 cars. As soon as this new Buick made its bow, engineering departments commenced to get busy on the 1930 line to appear next July. Some new models of the present line will make their debut at the January automobile show.

* * *

NEW cash discount terms are now practically 100 per cent effective, what with the Ford Motor Co., falling into line, under pressure of course, behind the Briggs Mfg. Co. and other late comers. Sheetmakers have demonstrated real solidarity and if the inauguration of the lower cash discount has done nothing else it has served to restore sheetmakers' faith and confidence in one another, because they have maintained unbroken ranks and it was this unity which presaged success. They realized of course that in some cases of parts makers, such as independent body-makers, et al., themselves under contract to supply the automobile builders on contractual arrangements which brooked of no change, it worked a temporary hardship since on these particular transactions they had to absorb their losses.

The sheet manufacturers, however, realized too that the only way to do it was to do it and they did it. They remained obdurate even when large consumers used their heavy tonnage as a club or a threat to force the retention of the old 2 per cent cash discount. They state they would have adopted the new regime even if they had not known their customers were in need of tonnage. This cash discount reduction means a net return to manufacturers of sheets of 80 or 90 cents per ton on some grades of sheets.

* * *

CHRYSLER-DODGE CORP. is fast forging to the front in the automobile world. Partial confirmation is received of the purchase by Walter P. Chrysler of a 67-story office building in New York City for headquarters, the reported consideration being $20,000,000. Last week bids were asked on a new plant here in Detroit, taking 1200 tons of steel, and within two days the contract was let to Whitehead & Kales. Earlier in the month a 250-ton addition to another plant was let to Russel Wheel & Foundry Co. It will erect a plant at Oakland, Calif., in the near future. A 70-acre site has been purchased in Canada between Ford and Walkerville, Ont., whereon a $1,500,000 automobile plant will be built in the near future to make 215 cars daily. Its Windsor plant now makes 150 daily. A line of ½ and ¾-ton commercial trucks is contemplated. The combined Chrysler-Dodge forces, now approximately 50,000 workmen, expect to produce 500,000 units during 1928, including Chryslers, Plymouths and DeSotos. About 500 of the latter now are coming off the assembly lines daily.

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AIRPLANES are becoming an increasingly popular mode of travel for sheet and other steel salesmen, branch office managers and other executives between Cleveland and Detroit. Harold Davey, Detroit manager for the Empire Steel Corp., and G. H. Charls, of the National Association of Flat Rolled Steel Manufacturers, recently crossed. A storm outside of Toledo created an air pocket which caused the tri-motored plane in which they were traveling to take a vertical drop of almost 200 feet. As Lake Erie rushed up toward the bottom of the plane, thrills were thrilling aplenty. Mr. Davey, however, counts airplane thrills secondary to rolling mill thrills. He remembers when his roller's tongs slipped and were forced out of his grasp and knocked from the rolls away back to the furnace and when his pants-leg, knee and shoe all were nicked in the operation.

* * *

EMPLOYMENT in Detroit continues to recede slightly. For the week ended Oct. 9 total number of employed by representative companies whose workers comprise two-thirds of the city's industrial population dropped to 293,010, compared with 294,829 for the week ended Oct. 2. This is the third consecutive weekly decline, after 22 consecutive weekly gains. In the week of Oct. 9 a year ago 195,844 persons were at work, or 97,166 less than at present. Of the 293,010 now working, about 125,000 populate the Ford shops.

* * *

AMONG the many favorable factors in connection with the present steel demand is the demonstrable fact that tonnage being specified is going into consumption. Each order is marked "at once" "ship immediately" "rush" or with some other terse, laconic injunction which puts the mill on its mettle. Almost phenomenal service is being rendered by mills in conjunction with the railroads. Often 24-hour service is obtained between Youngstown, O., and Detroit. Two-day service from Ohio is consistently maintained on shipments to the Ford Motor plants. It has been possible to achieve this success only by close co-operation between the mills and the railroads. Present demands upon steelmakers, however, contain many unfavorable factors which already constitute a deterrent. Almost every order contains special instructions or requires special treatment. Material must be burlapped just so; strapped just so; wrapped in tar paper; a special box-like housing built over the shipment in the open top or gondola car, etc., etc. All this constitutes so much "grief" for the branch office in seeing that instructions are carried out and just so many "extras" for the mill that production costs are increased and profits lowered. Some plants like Buick cooperate to the fullest extent of their ability. It specifies just what portion must be shipped in a given week and furnishes releases when the order is placed indicating the degree of urgency for each requirement.

Illinois in 1927 produced 38,970 tons of gravel fluorspar, against 47,254 tons in 1926.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

NEW HAVEN, CONN.—G. M. MacKenzie, 26 Water street, plans the construction of a 1-story machine shop, 50 x 150 feet. L. F. Caproni, Chapel street, is architect.

BALTIMORE—Independent Can Co. has been incorporated with $1,000,000 capital to establish a plant for the manufacture of cans by Edwin A. Parker, Howard and Ostend streets.

BALTIMORE—Hydro-Electric Switch Co., Calvert building, has been incorporated to manufacture and deal in railroad switches by Charles S. Eppley.

BALTIMORE—Locke Insulator Corp. has awarded the contract for its building, 35 x 75 feet, to C. W. Schmidt, Hearst Tower building. (Noted Oct. 4).

CHELSEA, MASS.—Everett Avenue Auto Parts Co., 234 Everett avenue, plans to build a 1-story machine shop, 45 x 100 feet.

HUDSON, MASS.—Department of light and power, L. D. Wood, manager, plans to build an addition to its power house, to include pumps, diesel engines, etc.

BLOOMFIELD, N. J.—Pioneer Heat Regulator Corp. has been incorporated with 2500 shares no par value stock to manufacture heat appliances, by C. Wallace Vail, Newark, attorney.

LAWRENCEVILLE, N. J.—American Telephone & Telegraph Co., 15 Dey street, New York, plans to build a transocean transmitting station, and has awarded the general contract for the work to Morton C. Tuttle, 31 St. James avenue, Boston.

BROOKLYN, N. Y.—Municipal Metallic Bed Mfg. Corp. has been incorporated with $20,000 capital by I. D. Abrams, 2 Lafayette street, Manhattan, attorney.

BROOKLYN, N. Y.—Kingsboro Roofing & Sheet Metal Co. has been incorporated with $20,000 capital by H. Mentag, 305 Broadway, attorney.

BROOKLYN, N. Y.—Crescent Pipe Corp. has been incorporated with $25,000 capital to manufacture and deal in tools and machinery by Botwin & Botwin, 230 Fifth avenue, attorneys.

BUFFALO—Stewart Bronze & Aluminum Foundry has been incorporated with 500 shares no par value stock by G. L. Grobe, Buffalo, attorney.

NUNDA, N. Y.—Nunda Iron & Metal Co. has been incorporated to manufacture and deal in metal and wood products by S. Gladner, Buffalo, attorney.

NEW YORK—Sheffield Mfg. Co. has been incorporated with $10,000 capital to manufacture and deal in fireplace fixtures, by H. Ernst, 1440 Broadway, attorney.

NEW YORK—Wardrobe Equipment Corp. has been incorporated with 200 shares no par value stock to engage in the business of machinists, by E. R. Hoffman, 500 Fifth avenue, attorney.

NEW YORK—Interstate Welding Corp. has been incorporated with $10,000 capital to manufacture and deal in engines by A. E. Herz, 277 Broadway, attorney.

NEW YORK—Milliken Valve Corp. has been incorporated with $100,000 in preferred shares and 2000 shares no par value stock to manufacture and deal in machinery, etc., by Wing & Russell, 14 Wall street, attorneys.

NEW YORK—Hill Gas Air Steam Boiler has been incorporated with $20,000 in preferred shares and 300 shares no par value stock to manufacture and deal in burners, etc., by G. M. Faynes, 475 Fifth avenue, attorney.

NIAGARA FALLS, N. Y.—Roher Electric Co. has been incorporated with 1500 shares no par value stock to manufacture and deal in motors, generators, etc., by Carroll & Deghan, attorneys.

NORTH TONAWANDA, N. Y.—National Grinding Wheel Co., 2984 Main street, Buffalo, has awarded the general contract for two 1-story plant buildings, to L. A. Hardin, 1335 Main street, Buffalo.

RENSSELAER, N. Y.—New York Central railroad has awarded the contract for alterations and additions to its engine house here, to Walsh Construction Co., Syracuse, N. Y.

SCHENECTADY, N. Y.—Carboloy Co., 350 Madison avenue, New York, plans the construction of a plant for the manufacture of metal alloys here.

TONAWANDA, N. Y.—Curtiss Aeroplane & Motor Co. has awarded the general contract for a 3-story airplane motor plant to James Stewart & Co., 17 East Forty-second street, New York.

UTICA, N. Y.—Weirs Wheel Works has been incorporated with $10,000 capital to manufacture and deal in vehicle bodies by E. M. Brown, Utica, attorney.

YONKERS, N. Y.—Nepperhan Foundry Co. has been incorporated with $250,000 capital to manufacture castings, etc., by J. Bowen, 81 Fulton street, Manhattan, attorney.

M'KEES ROCKS, PA.—Fire damaged the wheel foundry of the Pressed Steel Car Co.,

Resale Equipment News

ONE of the largest sales of navy surplus material in recent months will be made by sealed bids Nov. 2, at the Fore River plant of the Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass. The material is divided into 32 lots which will be bid on separately and a lump bid also may be made. Included in the sale are the following items: 183,000 pounds of bolts; 195,484 pieces brass bolts and screws; 118,081 pieces screws and pins; 4871 pieces rigging material; 136,118 pieces nuts; 99,468 pieces brass nuts; 27,733 pieces lock nuts; 8864 pounds dowels, universal joints washers and miscellaneous material; 2340 pieces brass fittings; 28,637 pieces electrical material; 34,000 pounds steel castings and fittings; 18,434 pounds brass in sheets, bars, etc.; 1350 pounds aluminum pipe, sheets and shapes; 60,000 pounds black and galvanized pipe and tubing; 142,000 pounds steel bar stock; 2250 pounds tool steel; 4210 pounds wire; 10,889 pounds black chain; 1681 brass castings; 3902 feet wire rope.

* * *

Real estate, plant, equipment and supplies of the Traffic Motor Truck Co., 5200 North Second street, St. Louis, was sold at auction Oct. 15.

* * *

Bids will be received until Oct. 26 at the office of the quartermaster, Ft. Niagara, N. Y., for waste material, including 14,000 pounds of cast iron and 4500 pounds of steel boilers.

* * *

Henry Disston & Sons Inc., Philadelphia, has sold the building it formerly occupied at Washington and Jefferson streets, Chicago, seven stories, 22 x 102 feet, to Joseph Saranella, who will remodel and install a sprinkler system. The structure is situated in a district largely devoted to light manufacturing.

Sales Calender

Oct. 18—*Auction sale of property of O. Armleder Motor Truck Co., Cincinnati.*

Oct. 30.—*Auction sale of machinery and equipment of the Carroll Foundry & Machine Co., Bucyrus, O.*

Nov. 2—*Sale by sealed bids of navy surplus at Fore River plant, Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass.*

Oct. 9, the machinery suffering as well as the building.

PHILADELPHIA—Morris Wheeler Co., Thirtieth and Locust streets, plans the construction of a power plant and garage. J. S. Simsohn, Broad and Girard streets, is engineer.

SHOENERSVILLE, PA.—Chamber of commerce plans the construction of an airport in the near future.

East Central

CHICAGO—R. E. Nu Parts Corp., 112 West Adams street, has been incorporated with $100,000 capital to manufacture and deal in equipment and devices for automobiles, trucks, airplanes, etc., by H. G. Yost and R. E. Golden.

CHICAGO—Electric Refrigeration Co., 4346 West North avenue, has been incorporated with $25,000 capital to manufacture and deal in refrigerators, by F. T. Johnson, W. E. Moss and Carl Eichstedt.

CHICAGO—Industrial Metals Laboratories, 1220 Webster avenue, has been incorporated with $50,000 capital to engage in the business of industrial and ceramic chemists by Grace R. Leigh, Helen E. Rehm and W. B. Fairfield.

CHICAGO—Kuehne Body Co., 2601 Archer avenue, has been incorporated with $30,000 in preferred shares and 1000 shares no par value stock to manufacture and deal in automobile bodies, and do general repair work, by A. W. Kuehne.

COLUMBIA CITY, IND.—Columbia City has awarded the general contract for the construction of a power plant addition and alterations to G. A. Walters, Columbia City Builders' Supply Co.

INDIANAPOLIS—Wheeler-Schebler Co., 1302 Barth avenue, manufacturer of carburetors, has awarded the general contract for a manufacturing plant. (Noted Sept. 20).

INDIANAPOLIS—Link-Belt Co., Holmes and West Michigan streets, has awarded the contract for the construction of a 3-story manufacturing plant. (Noted Oct. 4).

INDIANAPOLIS—Robert McGregor, Consolidated building, has awarded the general contract for a machine shop and garage, 70 x 200 feet, to be built at 1011 North Pennsylvania street.

ALGONAC, MICH.—Monnier Bros. & Co. have purchased a site for the erection of a plant for the manufacture of their line of boat hoists.

BATTLE CREEK, MICH.—Nichols & Shepard Co. is inquiring for assembly equipment. traveling crane, etc., for its proposed 1-story threshing machine manufacturing plant, to be built on Marshall street.

DETROIT—F. Joseph Lamb Co., 6343 Wight street, is inquiring for a large power punch press for sheet metal dies.

DETROIT—Crane Co., 836 South Michigan avenue, Chicago, is inquiring for overhead conveyors for handling pipe for its proposed 1-story plant.

DETROIT—Lincoln Mfg. Co., 2630 Erskine street, manufacturer of electrical supplies, has awarded the contract for a 4-story plant, 95 x 100 feet. (Noted Oct. 11).

DETROIT—Holcroft & Co., 6545 Epworth boulevard, plans the construction of a 1 and 2-story plant, 105 x 180 feet, for the manufacture of foundry equipment, on Westwood avenue. C. L. Phelps, 504 Detroit Savings Bank building, is architect.

ESCANABA, MICH.—Chatfield Machine & Foundry Co., 718 Stephenson avenue, has been incorporated with $75,000 capital to engage in a general foundry and machine shop business, by Hubert H. Shepeck.

FLINT, MICH.—A C Spark Plug Co., Dort Highway, has awarded the general contract for its construction work including a heat treating building and a die casting building. (Noted Oct. 11).

LANSING, MICH.—Bean Spray Pump Co. plans the construction of an addition to its plant. J. N. Churchill is architect.

MUSKEGON, MICH.—American Coil Spring Co., Chicago, will move its plant to Muskegon where it will occupy a new manufacturing building. W. W. Bitzer is head of the company.

SAGINAW, MICH.—Baker-Perkins Co. Inc. is inquiring for miscellaneous machinery and equipment for its 1-story foundry, 100 x 340 feet, to be built on Hess street. (Noted Sept. 27).

BEECHWOOD, O.—Smith Incubator Mfg. Corp. has been incorporated with 250 shares no par value stock by L. M. Preman, S. M. Sohns and P. A. Meserve.

CINCINNATI—Wessling Bros. Foundry Co., A. G. Wessling, McLean street, manager, contemplates the construction of a foundry building.

CLEVELAND—Gloglass Corp. has been incorporated to manufacture reflector signs, by Edgar H. Weil, 6700 Grant avenue, president.

CLEVELAND—Huber Instrument Co. has been incorporated to manufacture surgical instruments, by W. I. Huber, president.

CLEVELAND—Lyons Machine Shop, J. H. Lyons, 5601 Tillman avenue, proprietor, has awarded the general contract for a 1-story machine shop addition to D. Gilchrist, Berea, O.

CLEVELAND—Enamel Products Co., Eddy road, has awarded the general contract for a new building, 40 x 80 feet, for its sign department.

CLEVELAND—Buckeye Forgings Co., 10003 Harvard avenue, J. W. Baxter president, plans

Where Machinery Exports Went in July

	Lathes			Drills			Gear	Planers and	Milling	Ma-	Pneumatic
	Engine	Turret	Other	Vertical	Radial	Other	cutters	shapers	knee-column	chines other	portable tools
Belgium	6	2	3	2	.....	2	6	3	.....	2	.....
France	4	3	17	51	.....	14	15	2	9	34	267
Germany	4	3	1	1	1	6	1	3	.....	9	187
Italy	.....	2	.....	.....	1	.....	1	.....	2	.....	54
Netherlands	3	.....	2	.....	.....	1	1	.....	.....	.....	9
Russia	1	.....	.....	.....	.....	.....	.....	.....	1	2	5
Spain	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78
Sweden	2	2	.....	.....	1	.....	2	.....	.....	1	.....
United Kingdom	9	2	39	6	.....	55	4	5	3	4	471
Canada	12	16	27	30	2	208	4	5	1	6	203
Mexico	1	.....	1	1	.....	7	.....	.....	.....	.....	15
Cuba	.....	1	1	2	.....	20	.....	.....	.....	.....	11
Argentina	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	35
Colombia	1	.....	1	.....	.....	13	.....	1	.....	.....	18
Chile	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Brazil	2	.....	1	.....	.....	.....	.....	.....	.....	.....	36
Japan, Chosen	.....	.....	2	.....	.....	1	.....	1	6	.....	181
Australia	.....	1	4	.....	.....	36	.....	.....	.....	1	60
British South Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
Venezuela	.....	.....	1	.....	.....	.....	.....	1	.....	.....	5
Other countries	6	4	6	4	1	15	1	3	6	.....	149
1928											
July	52	36	106	97	6	381	35	24	28	.....	1,815
June	85	43	42	52	15	89	38	44	47	115	1,614
May	63	60	41	23	10	72	43	24	22	34	1,706
April	39	41	125	62	8	71	30	46	19	43	2,462
March	95	29	33	75	16	80	26	37	33	47	1,928
February	68	30	53	19	13	56	24	36	24	51	.....
January	66	26	57	42	18	42	31	40	30	81	.....
Total, 1927	716	280	444	376	105	862	379	42	270	491	.....

the construction of a 1-story machine shop, 60 x 120 feet.

CLEVELAND—Cloyes Gear Works has awarded the contract for a plant to be constructed on Roseland avenue, to Mitzel Co., Keith building. (Noted Sept. 27).

CLEVELAND—Stebbins & Rich Brass Mfg. Co., organized recently, has obtained manufacturing quarters at 6723 Denison avenue and is soon to start manufacture of plumbing supplies.

CLEVELAND—Smith-Armstrong Forge Inc. has been incorporated with 1000 shares no par value and $50,000 shares preferred stock by Elizabeth Armstrong, Joseph C. Hostetler, Union Trust building, and E. A. Smith.

CLEVELAND—W. S. Tyler Co., 3615 Superior avenue, has awarded the general contract for its plant addition for the manufacture of its wire cloth and screen products to John Gill & Sons, Bulkley building.

CLEVELAND—Cleveland Metal Hose Co. has been incorporated with Edward Pierce, president and general manager. The company is building a plant at 3710 East Ninety-third street to manufacture automotive metal hose.

CLEVELAND—Cleveland Coupling Mfg. Co. has been incorporated by Walter E. Phillips and is to have manufacturing quarters in the Cleveland Metal Hose Co.'s building, 3710 East Ninety-third street.

CLEVELAND—Cleveland Cutter & Reamer Co., 7410 Madison avenue, has work nearing completion on a machine shop. The W. F. Hyde Co., contractor, is expected to complete the work in about three weeks.

CLEVELAND—Contract for rebuilding a 4-story building of the Forest City-Walworth Run Foundries Co. at West Twenty-seventh street, burned in a recent fire, has been awarded the Sam W. Emerson Co.

CLEVELAND—Eaton Axle & Spring Co., East 140th street, has awarded the general contract for its manufacturing plant addition, 300 x 400 feet, to Crowell & Little Construction Co. The addition is to be completed Jan. 1.

CLEVELAND—Western Stamping & Mfg. Co., St. Paul, has leased 30,000 square feet of space on Settlement road, Parma, for a manufacturing plant, and will move its machinery and equipment here when it is ready for occupancy. T. W. Wilwerscheid is president of the company.

EAST LIVERPOOL, O.—Patterson Welding & Repair Co. has been incorporated with $10,000 capital by R. L. Cawood, H. N. Harker and J. S. Scott.

RAVENNA, O.—Jones Bros. Co. of this city, has the contract for the construction of the new plant for the Ferry Machine Co., now located in the Harris building. The new building will be about 40 x 80 feet.

SALEM, O.—Mullins Mfg. Co. plans construction work which will increase the plant capacity 50 per cent. The addition to be built by Jan. 1, will include 10 modern double action presses. The expansion program follows several important contracts received recently.

SPRINGFIELD, O.—Ohio Steel Foundry Co. plans the erection of a new pattern storage shop and other buildings as part of its expansion program, to be put into effect in the near future.

TOLEDO, O.—Toledo Screen & Weather Strip Co. has been incorporated with 250 shares no par value stock by J. H. Cannon, L. M. Kanve and R. F. Carlton.

WARREN, O.—Sterling Knight Motor Co. has been purchased by the Van Huffel Tube Corp., of this city.

Southern States

HUNTSVILLE, ALA.—Rome Electric Range Co. has awarded the contract for the first unit of its plant, 52 x 521 feet, to George A. Roders.

NEW ORLEANS—George P. Blaise will build 42 x 115 garage and repair shop at Iberville and Marais streets.

HOBART, OKLA.—City of Hobart soon will award contracts for waterworks improvements including purification plant, motor driven centrifugal pumps, etc.

SAPULPA, OKLA.—City of Sapulpa plans construction of an electric light plant.

SPAVINAW, OKLA.—City of Tulsa plans construction of a hydroelectric power plant on Grand river, near here.

TULSA, OKLA.—L. E. Smith Inc. has been awarded contract to erect new hangar, 100 x 120 feet, at municipal airport.

CHATTANOOGA, TENN.—Crane Co. plans the construction of a plant here for the manufacture of its line of radiators, heating plants, etc.

YORKTOWN, TENN.—Chamber of commerce is interested in establishing an airport on an 80-acre site just west of here.

AMARILLO, TEX.—South Plains Pipe Line Co. has increased capital from $10,000 to $500,000 to provide for expansion and improvements.

BEAUMONT, TEX.—Kansas City Southern railroad, Kansas City, Mo., is inquiring for machinery and equipment for proposed repair shops, roundhouses, etc., for development here.

BEAUMONT, TEX.—Waco, Beaumont & Trinity railroad, known as the Duff line, has has located site for shops at Elizabeth, six miles from Beaumont and has started construction of road to Port Arthur and Waco, Tex. T. A. Hamilton is executive vice president in charge of construction.

DALLAS, TEX.—City commissioners have authorized the purchase of 298 acres near here, for establishing an airport.

DOWLING, TEX.—Texarkana & Fort Smith railroad, plans a development program including transportation yard and power plant here.

FORT WORTH, TEX.—Texas-Worth Tool Co. is inquiring for machinery and equipment for the manufacture of tools and parts for oil field work for its recently acquired plant. (Noted Sept. 27).

HOUSTON, TEX.—Avery Battery Mfg. Co. has been incorporated with $7500 capital by R. M. Livesay, D. A. Snyder and E. Wilkenfeld, 4449 Walker street.

HOUSTON, TEX.—Houston Lighting & Power Co., Electric building, has awarded the general contract for a 1 and 3-story service and shop building, 108 x 300 feet, to be built on Canal street.

SAN ANTONIO, TEX.—Voss Artistic Scroll Metal Works Inc., 101 Columbus street, has increased its capital to $55,000 and may plan for future expansion.

WACO, TEX.—Atlas Portland Cement Co., John R. Morron, president, has announced construction of plant at Waco with initial annual production of 1,000,000 barrels.

WEATHERFORD, TEX.—Weatherford, Mineral Wells & Northwestern railroad, J. L. Lancaster president, plans to rebuild its burned roundhouse and tool shop.

BEDFORD, VA.—Nardin-Armstrong Corp., H. E. Armstrong, president, plans the construction of a plant 150 x 350 feet, for the manufacture of steel stampings, dies, tools, etc.

PULASKI, VA.—Town council has authorized the establishment of an airport on a 60-acre tract.

Western States

LONG BEACH, CALIF.—Perfect Caster Mfg. Co., 1132 Newport avenue, is building an addition to its plant, to increase the floor space by 7000 feet. Additional equipment will be installed.

LOS ANGELES—Los Angeles Foundry Co., 2444 South Alameda street, is adding 6000 square feet to its present building.

LOS ANGELES—Emsco Forging Co., Boyle & Slauson avenue, has recently enlarged its floor space 10,000 square feet.

LOS ANGELES—Richter Bros. has moved to its new plant at 209-11 Garey street where it will manufacture sheet metal work and ornamental stampings.

LOS ANGELES—Merit Mfg. Co. has built a plant at 7015 McKinley avenue to have a capacity of 500 automatic storage water heaters a day and will occupy 6000 feet of floor space.

LOS ANGELES—Master Metalath Mfg. Co., 6100 South St. Andrews place, has rebuilt its plant and replaced the equipment burned in a recent fire. The company manufactures self-furring wire lath.

LOS ANGELES—National Standard Mfg Co., located at Niles, Mich., has purchased a local plant for the manufacture of bead wire for automobile tires and will erect a plant addition of 6000 square feet.

LOS ANGELES—Electric Steel & Mfg. Co., 3334 East Slauson avenue, has awarded the contract for a plant addition, 60 x 130 feet. The company will also install a new annealing furnace, core baking oven and sand blasting equipment. (Noted Aug. 9).

TIBURON, CALIF.—Northwestern Pacific railroad plans to build a shop here. G. H. Hicks, 64 Pine street, San Francisco, is chief engineer.

VAN NUYS, CALIF.—Nenzel Mfg. Co., 14350 East Calvert street, has begun operations manufacturing a new type of electric flashlight to be attached to the forehead or hooked in any position.

SMITH ISLAND, WASH.—Bureau of yards and docks, Washington, plans the construction

of a naval radio compass station, power house, etc., and has awarded the general contract to Bert Ward, 2512 Boylston avenue, North Seattle, Wash.

West Central

SIOUX CITY, IOWA—Albertson & Co., manufacturers of automotive tools, have work under way on the construction of a plant addition, 44 x 155 feet.

MINNEAPOLIS—City of Minneapolis has awarded the general contract for a 1-story machine shop and storage building to Standard Construction Co., Plymouth building.

ASHLAND, Wis.—Minneapolis, St. Paul & Sault Ste. Marie railroad plans the addition of five stalls to its roundhouse here. The general contract for the work has been awarded to Frank Tomlinson, Ashland.

SIOUX FALLS, S. D.—International Harvester Co., 606 South Michigan avenue, Chicago, plans the construction of a plant addition, 172 x 229 feet, here.

Canada

WINNIPEG, MAN.—Bids are being received by the chairman of the committee on public utilities, until November 19, for delivery at Slave Falls, Man., of a large quantity of equipment and supplies to be used in connection with power development plant under construction at Slave Falls. Equipment to be purchased includes generators, complete with accessories and spare parts. Also the erection of five spillway gates, four sluice gates, stop logs, etc. Plans and specifications with the Winnipeg Hydro Electric Co., 55 Princess street, Winnipeg.

BROOKVILLE, N. B.—Maritime Portland Cement Co. Ltd. has been incorporated to manufacture and deal in cement and to carry on the business of iron making, steel manufacturing, engineering, etc., with $750,000 capital and 20,000 shares of no par value stock, by Robert D. Paterson, Stanley G. Olive and Harry E. Reardon.

BRAMPTON, ONT.—Brampton Die Tool Mfg. Co. Ltd. has been incorporated to manufacture and deal in iron, brass, and steel and other metals, with $150,000 capital by Herbert A. W. Plaxton, Joseph S. Booth and Lillian O. Pike.

BRANTFORD, ONT.—Workrite Radio Ltd. has been incorporated to manufacture and deal in radio receivers and apparatus with $100,000 capital and 4000 shares of no par value stock by Archibald M. Harley, John A. D. Slemin and Charles C. Slemin.

CAPREOL, ONT.—Town council is contemplating installing a water pumping system and sanitary sewage plant.

CHATHAM, ONT.—G. G. McKeough, 329 Wellington street, west, is making arrangements for the erection of a new machine shop here, and proposes to turn old building into a show room.

HAMILTON, ONT.—National Steel Car Corp., Kenilworth avenue, proposes to start work immediately on plant addition here.

HAMILTON, ONT.—Bids are being received by S. McPhie, architect, Sun Life building, no closing date set, for an addition to the plant of Wallace Barnes Co. Ltd., 274 Sherman avenue west, manufacturer of flat, coil, phosphor bronze and steel wire springs, etc. Building to be 2-story and basement, 60 x 120 feet, structural steel and brick construction.

INNERSKIP, ONT.—Dufferin Construction Co. Ltd., foot of Bathurst street, Toronto, Ont., has awarded structural steel contract to the Sarnia Bridge Co., Sarnia, Ont., for the erection of a repair shop and storage building here. Building to be 60 x 100 feet, steel construction.

NORTH BAY, ONT.—Northern Supplies Ltd. has been incorporated to manufacture and deal in automobiles, motors, engines, implements, etc., with $40,000 capital by Duncan R. Kennedy, Frederick S. Dunlevie, and Walter J. Gilhooly.

PETERBOROUGH, ONT.—Ferguson Contracting Co. Ltd., Confederation Life building, Toronto, Ont., general contractors for the erection of the new punch press building here for the Canadian General Electric Co., has awarded structural steel contract to the Dominion Bridge Co., Bedford building, Toronto, and the reinforcing steel contract to the Trussed Concrete Steel Co. of Canada Ltd., Federal building, Toronto. Proposed building to be 1 story, 110 x 328 feet, steel and brick construction.

New Trade Publications

NICKEL STEEL—International Nickel Co., New York, has issued another of its series of illustrated bulletins to show the application of its material to various branches of industry.

ABRASIVES—The Norton Co., Worcester, Mass., has prepared a booklet on the character and uses of Norton products. It is a description of the exhibit of abrasives at Norton hall, at the company's plant at Worcester. It is illustrated and interestingly written.

INSULATION—Heat insulation in the smelting and refining of nonferrous metals is the subject of a brochure by the Celite Products Co., Los Angeles. It is illustrated with views of installations and diagrams show application of the insulation in various types of furnaces.

RESEARCH—Metropolitan Life Insurance Co., New York, has prepared a bulletin as No. 2 of a series of reports on applying research to production. This is devoted to a history of the accomplishments of 28 New England companies in standardization and simplification.

STEEL HANGARS—American Institute of Steel Construction, New York, has prepared for distribution a bulletin on steel hangars for airships. It is illustrated to show the application of steel construction to this type of structures.

SURGE TANKS—Chicago Bridge & Iron Works, Chicago, is distributing a booklet featuring its line of differential surge tanks. The publication describes advantages to be obtained by the use of this type of tank for hydraulic power plant regulation. It is well illustrated.

TEMPERATURE CONTROL—Brown Instrument Co., Philadelphia, has issued the second of a series of folders illustrating modern heat treating problems and appliances. The current folder features 22 jobs using gas fired furnaces, and their temperature controls.

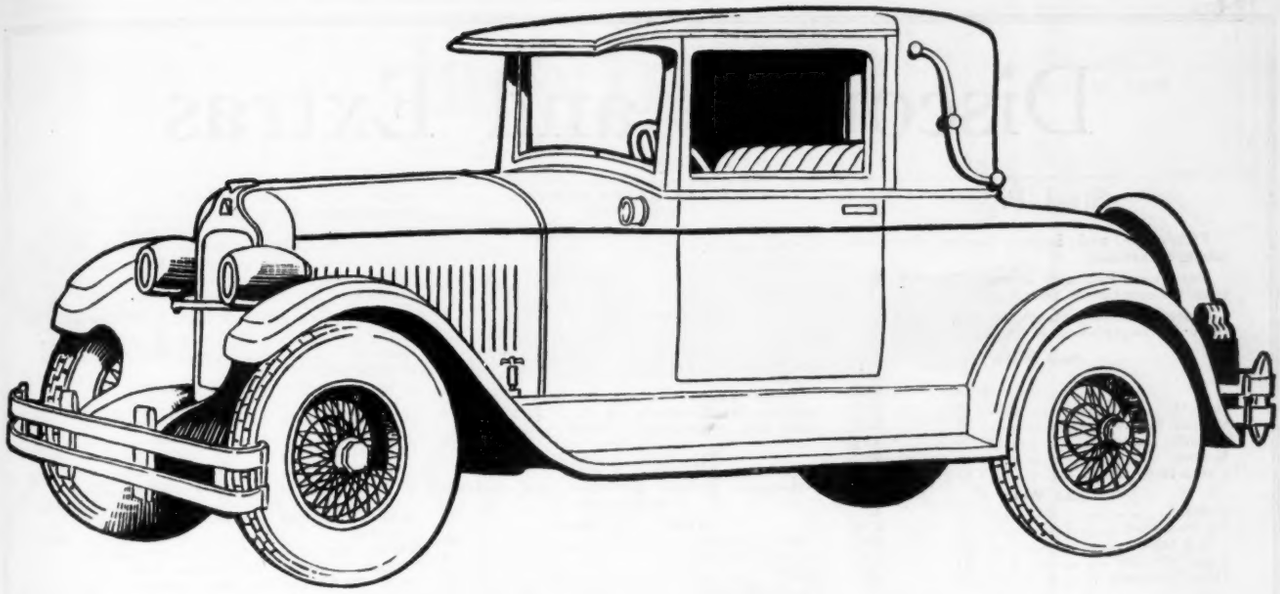
ZINC ROOFING—New Jersey Zinc Co., New York, in a current bulletin describes advantages of the use of zinc for roofing and siding. The booklet includes estimating and drafting details and detail drawings for use of architects and engineers. Application of the sheets in various uses is shown in drawings.

CULVERTS—Armco Culvert Manufacturers association, Middletown, O., has issued a bulletin calling attention to the selection of culverts and drains on the basis of cost per year. The situation is analyzed to show the real cost of such installations and the average per year for maintenance.

STEEL CASTINGS—Nugent Steel Castings Co., Chicago, has issued a booklet describing the course taken by every casting leaving its foundry, to insure quality and perfect condition. The description starts with arrival of the pattern, its test, through the process of making the casting and its inspection before approval. Illustrations show the actual work in the foundry and its departments.

CUPOLA EFFICIENCY—J. S. McCormick Co., Pittsburgh, has issued a folder giving data on cupola efficiency. The folder explains how to calculate the ratio of coke to iron in a cupola and gives the air necessary to react with the carbon to melt a given amount of iron per hour. The feature of the folder is a table giving volume of air per minute and quantity of coke per hour for melting zones of various sizes. The table also gives the horsepower of the motor and the power consumption which this company provides for various sized cupolas.

MATERIAL HANDLING EQUIPMENT—Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O., has issued a catalog of its various devices for handling materials. The catalog is illustrated to cover details of construction, installation, operation and application to a wide variety of industrial uses. Specifications and engineering data are furnished. This publication covers the subject of materials handling, in its field, completely. A wide variety of accessories for handling a varied list of materials is included.



EMPIRE AUTOMOBILE SHEETS

Rolled from ingots of exceptional purity and uniformity. Scientific treatment of the metal in the open hearth and the distinctive Empire method of pouring result in ingots that are low in sulphur, free from "pipes" and seams.

Close supervision by competent metallurgists thru every production process enable Empire Sheets to meet the most exacting specifications.

One Piece Fender Stock

Body Stock *Hood Stock*

Empire Steel Corporation, Mansfield, O.

Sales Offices:

Detroit, Mich. - 7-233 General Motors Bldg.
Cicero, Ill., (Suburb of Chicago) - 1838 So. 54th St.
Philadelphia, Pa. - 3701 Broad St., National Bank of North Philadelphia Bldg.

EMPIRE STEEL SHEETS

Sales Offices:

Indianapolis, Ind. - 1412 Merchants Bank Bldg.
Cleveland, Ohio - 2002 Union Trust Bldg.
St. Louis, Mo. - 419-22 Chemical Bldg.
New York City - Room No. 1106 A, National City Bank Bldg., 17 East 42nd St.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLING

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 4½-inch	46 off
5 to 6-inch	40 off

(Note—Additional discounts of seven extra 5 per cents now being given on 21,000 pounds or more.)

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of two 10's and one 2½ now being given on 12,000 pounds or more.)

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48-off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	45 off

SEAMLESS HOT ROLLED

2 and 2½-inch	40 off
2½ and 2¾-inch	48 off
3-inch	52 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
21-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5¾-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot	.20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)
Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)
Additional extra ..... .20c